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PREOPERATIVE STOMA SITE SELECTION
AND
PERISTOMAL LEAKAGE PROBLEMS ©

BY

SUSAN MARGARET CAROL RUSSELL

A thesis submitted to the faculty of Graduate Studies and Research in partial fulfilment of the requirements for the degree of MASTER OF NURSING.

FACULTY OF NURSING

Edmonton, Alberta
Fall 1992

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled PREOPERATIVE STOMA SITE SELECTION AND PERISTOMAL LEAKAGE PROBLEMS submitted by Susan Russell in partial fulfilment of the requirements for the degree of Master of Nursing.

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October 5, 1992

Dedication

To each patient and family, who shared their intimate feelings about a very personal and private aspect of their lives, and who taught me so much, thank you. My hope is that this study furthers our understanding of what you experience in everyday life, and how the small things provide positive meaning towards your quality of life.

To my dear husband, Bob, who has supported this endeavour in countless ways, who also values individuals for who they are, not what. His patience and wisdom have been invaluable. I could not have done this without his constant support, constructive guidance, humour, and love.

To my dear children, Jeffrey and Lorelei, who have supported me with an abundance of humour and love along the way. Their joy and laughter have been an endless resource of vitality.

To my dear father, who supported my dream and gave me hope.

Abstract

When ostomy surgery is a possibility, optimum siting of the stoma preoperatively, is a pivotal part of preventing peristomal leakage and thus, facilitating a positive rehabilitation. The relationship between preoperative stoma site selection and the incidence of peristomal leakage, using a comparative descriptive research design, was explored. The criteria for selecting a stoma site used in this project, were derived from a review of the literature and validation by practising enterostomal therapy nurses. A convenience sample of 46 selected subjects, ages 21 to 85 years, and who had a permanent or temporary colostomy or ileostomy, participated in the study. The stoma site was selected, using specified criteria, preoperatively for 34 subjects who had elective ostomy surgery. For the 12 subjects who had emergency surgery, the stoma site was not selected preoperatively. Information about factors which influence stoma selection and peristomal leakage, and the impact both have on adjustment, was collected. Participants were able to identify eight factors which contributed to their leakage problems. It is evident that the incidence of peristomal leakage is a significant problem for many individuals and affects their confidence in resuming their preoperative activities. All participants in the study valued the support of family and friends. The nursing practice of siting a stoma preoperatively is essential. The impact peristomal leakage has on the personal adjustment of having an ostomy needs to be explored further.

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CHAPTER ONE

Research Problem

Ostomy surgery is recommended when a person's life is either threatened or intolerable as the result of disease or trauma to the bowel or bladder. The surgery, although intended to improve a person's health status, can be a source of distress, due to the loss of normal bowel control (Bokey & Shell, 1985). However, for non-continent stomas, an alternative form of control can be achieved with a secure pouch system fitted over the stoma. A secure pouch system implies an absence of peristomal leakage.

For individuals who have an ostomy, peristomal leakage can be an exasperating and challenging problem which people have identified as a significant impediment affecting personal adjustment to having an ostomy (Dailey, 1970; Plumley, 1939). Peristomal leakage compromises feelings of security, and reduces patients' confidence about resuming their former lifestyle and activities. Freedom from leakage and a sense of security is needed before individuals feel sufficiently protected to resume the activities they engaged in prior to their ostomy surgery (Devlin, Plant, & Griffin, 1971; Mahoney, 1976; Sparberg, 1971).

Inappropriate location of a stoma is the principal cause of peristomal leakage (Dailey, 1970; Hill, 1976; May, 1977; Todd, 1978; Watt, 1982). Elcoat (1986) states a "patient's ability to lead a full and active life will be greatly compromised if the stoma is misplaced" (p.153). Thus, the selection of a stoma site preoperatively has been considered an essential aspect of preoperative care when ostomy surgery is anticipated (Brooke, 1952; Bubrick & Rolstad, 1992; Flannery, 1960; Fussell, 1976; Gillen & Peel, 1986;

Goligher, 1978; Hughes, 1976; Jagelman & Reeves, 1973; Jeffries, 1986; Kretcshmer, 1978; Lyons, 1965; MacKenzie, 1965; Nahra, 1977; North, 1987; Ray, Hanley, & Hines, 1964; Vukovich & Grubb, 1977; Winkler, 1986). Today, even for neonates, the selection of a stoma site preoperatively is considered fundamental (Boarini, 1989).

Interest in this study evolved over five years clinical practice as an enterostomal therapy (ET) nurse. As an ET nurse, I saw approximately 150 new clients each year, selected and marked stoma sites preoperatively for many patients, using knowledge and practice derived from my clinical experience. Not all patients had their sites selected preoperatively. It seemed that those patients who did not have their sites preselected, had a greater incidence of peristomal leakages than those who did have their sites preselected. I recognized a need to validate this nursing practice through research.

The purpose of this research study then was to examine the relationship between preoperative stoma site selection and the incidence of peristomal leakage. It was hoped that it would also be possible to identify common factors related to the incidence of leakage encountered. The incidence of peristomal leakage has been identified as a pivotal factor affecting personal adjustment to having an ostomy.

Assumptions

This study is based on the assumption that selection of a preferred stoma site is possible when using a predetermined set of criteria. The phrase, ***preferred stoma site***, refers to an individualized location which maximizes self-care and adherence potential of an ostomy pouch. The selection of a site varies with each person due to differences in abdominal dimensions and contours, as well as physical abilities and occupations.

Research Problem

Traditionally the preoperative selection of stoma site is based on the type of ostomy proposed, individual anatomical features, visual and physical abilities, plus lifestyle characteristics such as occupation and clothing. Patients who have ostomy surgery vary in age, weight, level of activity, type of ostomy, disease, length of hospitalization following surgery, and level of confidence in changing their ostomy pouch. It may be that a relationship exists between these variables and the incidence of peristomal leakage. If such a relationship exists, it may have implications for individual patient teaching. Thus, there was a need to explore the possibility of common variables associated with peristomal leakage.

In order to eliminate potential leakage problems, the stoma must be in an appropriate location, individualized for each person. The question: *does preoperative stoma site selection reduce the occurrence of peristomal leakage?* needed to be investigated in a research study.

Research Questions

The following hypothesis is based on the results of a review of the literature about bowel ostomies, the practice of enterostomal therapy nursing, and the personal experience of the principal investigator.

H 1 - Adult patients who have a stoma site selected preoperatively will experience fewer episodes of peristomal leakage than those who have the stoma site selected during the operation.

Freedom from peristomal leakage is needed before individuals feel secure and confident enough to return to their former lifestyles and activities. Thus, the relationship between peristomal leakage incidents and an individual's confidence in resuming daily living activities, needed to be explored. A second hypothesis, also based on the results of the literature review and personal experience of the principal investigator was proposed.

H 2 - For adult patients who have had bowel surgery involving an ostomy, there is a negative relationship between the number of incidents of peristomal leakages and the degree of confidence they have in resuming their former activities.

Definition of Terms

For the purposes of this study the following definitions are used:

Ostomy: a temporary or permanent surgically created opening into a hollow organ.

Colostomy: a surgically created opening anywhere along the colon and connected with the abdominal wall. It may be a permanent, nonreversible stoma or temporary.

Ileostomy: a surgically created opening usually in the terminal ileum and connected with the abdominal wall. It may be permanent, or temporary.

Stoma: the visible portion of the bowel which is exteriorized and fixed to the skin as an opening. This term is used interchangeably with ostomy.

Enterostomal therapy: a nursing speciality, conceptualized in 1961, to address the needs of patients who have ostomies, draining wounds, fistulae, pressure sores, or are incontinent (Anderson, 1982).

Enterostomal therapist: a registered nurse who has completed a post-graduate education program in enterostomal therapy. This phrase is used interchangeable with stoma nurse or stoma(l) therapist.

Stoma site selection: the process whereby an ET or trained registered nurse when consulted by a physician and in discussion with a patient, predetermines a suitable location for a stoma, based on the individual patient's needs, anatomy, lifestyle and proposed surgery.

Peristomal leakage: seepage of ostomy contents between pouch and skin, compromising the adherence of an ostomy pouch, causing odour and/or stool to be uncontained (Gruner, Naas, Fretheim, & Gjone, 1977).

Pouch: an odour proof or odour resistant plastic bag which is designed to be applied over a stoma and adhered to the peristomal skin area. A seal is created enclosing the faecal odour and effluent. The term is used interchangeably with appliance.

Malignant disease: any type of cancer.

Non-malignant disease: this term is used to refer to ulcerative colitis, diverticulitis, familial polyposis, Crohn's disease, or other inflammatory/infectious processes.

Overview of the Thesis

This thesis is organized into five chapters. The following chapter is a review of the selected literature relevant to the research project. In chapter three, methods, procedures, and the results of two pilot studies are delineated. A description of the sample and the findings is presented in chapter four. The results and implications of the study are discussed in chapter five.

CHAPTER TWO

Literature Review

The vast amount of the medical literature about ostomies relates to the surgical techniques of constructing a stoma, and associated mortality and morbidity, such as peristomal hernias, ischemia of the mucous membrane of the stoma, and retraction. There is also an extensive amount of nursing literature which focuses on the management of a stoma and coping with an ostomy. In the psychology literature, the adjustment process to having an ostomy, is addressed. Throughout the literature, peristomal leakage is minimally discussed, and the implications of leakage are not addressed extensively. Leakage is identified as a factor which negatively affects personal adjustment; however, the impact it has on adjustment is not clearly understood. The focus of this review is the factors related to preoperative stoma site selection and their role in preventing peristomal leakage. The impact of peristomal leakage on an individual's lifestyle and adjustment is explored.

The practice of stoma site selection preoperatively, using a specified set of criteria, is advocated by many, although the practice has not been validated through research. The relevant literature on stoma site marking and the relationship it has with peristomal leakage is mainly descriptive and anecdotal, representing opinions and clinical impressions.

This review is limited to English language textbooks and journal articles, and published and unpublished theses when accessible. The literature was identified from an electronic search of the following indexes: Medline, 1966 to 1992; Psychological Abstracts, 1973 to 1992; Psychiatric Medline, 1980 to

1992; Cumulative Index for Nursing and Allied Health, 1983 to 1992; and Sociological Abstracts, 1982 to 1992. The key words used were ostomy, colostomy, ileostomy, enterostomal therapist/therapy, stoma and leakage. In order to understand the social implications of having ostomy surgery and the leakage of bowel effluent, how the practice of stoma site selection evolved and the criteria used in marking, a historical search of the literature was done using a reverse snowball technique. This was necessary to identify the origins of beliefs still held today about ostomies, and how the criteria for stoma site marking evolved.

The history of ostomy surgery and the management of the associated loss of continence is briefly reviewed. The introduction and use of ostomy pouches is discussed. The psychological and social implications of having an ostomy are highlighted. Factors about peristomal leakage and stoma site marking in the literature are presented.

Historical Perspective of Ostomy Surgery

The concept of elective ostomy surgery dates back to the mid-eighteenth century when an individual's life, threatened because of an incarcerated hernia, was saved by creating a colostomy (Turnbull, cited in Anderson, 1982). Ostomy surgery began to be seen as a cure for some tumours (Cattell, 1933) as well as for hernias and imperforate anus. As early as 1935, the surgery was beginning to be accepted by some as a palliative measure (Gabriel & Lloyd-Davies, 1935). Babcock (1939) however, believed it was better to provide soothing opiates and alcohol, rather than have patients be a burden and an offense to others as well as themselves.

Though patients lived longer with a colostomy, Dubois (1936) viewed a colostomy as a *handicap*. Druckerman (1938) believed that with time the negative aspects of a stoma faded, but nonetheless, he perceived that the ostomy was a burden in patients' lives. Although there are difficulties in adjusting to having an ostomy, it is now considered to be a positive option by many. However, this feeling is not universal and even today patients are refusing to have a permanent ostomy (Despretz, Otmezguine, Grimard, Calitchi, & Julien, 1990).

Today, ostomy surgery is accepted as a palliative treatment for the relief of pain; a cure for cancer, ulcerative colitis (UC), and familial polyposis; temporary relief for Crohn's disease; and a temporary measure for perforated diverticulum (Coellen, 1989; Ravo & Ger, 1985), and bowel perforations from trauma or infections (Chappuis, et al., 1991; Levison, Thomas, Wiencek, & Wilson, 1990; Schein & Decker, 1988; Watt, 1985). Creating an ostomy for all cases of trauma to the bowel is not always recommended due to improved surgical techniques and postoperative management (Burch, et al., 1991; Huber & Thal, 1990; Murray, 1991). Ostomy surgery is also an option for patients who have a totally incompetent anal sphincter due to childbirth injuries and for those who have severe constipation associated with neurological conditions, such as, spinal cord injury or multiple sclerosis (Hosie, Kmiot, & Keighley, 1990; Stone, Wolfe, Nino-Murcia, & Perkash, 1990; Yoshioka & Keighley, 1989). Ostomy surgery may also be performed to relieve chronic radiation enteritis (Fenner, Sheehan, Nanavati & Ross, 1989).

Surgery for UC often restores good health, unless arthritis secondary to the colitis has occurred (Kennedy, 1988). Individuals are offered the opportunity to return to their former lifestyles (Mahoney, 1976; Shipes, 1987a). In fact, many patients with UC feel their social life improved following ostomy surgery (Kennedy). They are no longer troubled with diarrhoea, urgency and incontinence, and have fewer difficulties with their employment than those with active UC (Wyke, 1988). They feel more confident in their ability to have a *normal* life since they do not have the constant worry of needing to know where the nearest washroom is located (Daly & Brooke, 1967; Roy, Sauer, Beahrs, & Farrow, 1970; Watts, De Dombal, & Goligher, 1966; Wilson, 1964).

For patients with malignant tumours obstructing the lumen of the bowel, a diversion of the faecal effluent above the level of the obstruction, diminishes abdominal distention, and relieves the associated pain. If a cure is not possible, it is hoped that ostomy surgery can serve as a palliative and comfort measure. The quality of their lives is enhanced when the discomfort and distension associated with a bowel obstruction is relieved, permitting them to eat without the hazard of vomiting.

Surgical Trends

Over the years progressive improvements in surgical techniques and the construction of stomas has resulted in a decrease in the morbidity and mortality associated with the surgery, as well as the implications of the surgery on the quality of life. Babcock (1939) preferred locating a colostomy in the perineum, to reflect the former location of the anus. In a study of 220 patients who had a perineal ostomy, often referred to as an artificial anus, Babcock found that they preferred this location as compared to those who had an abdominal stoma. At this time, it was believed that control of the effluent could be achieved with diet. Babcock found that patients with a perineal stoma had better control than those with an abdominal stoma. However, this belief was not universal as Shedden (1932) advocated locating the stoma on the abdomen to facilitate visual management of an ostomy. By the mid 1940s few perineal colostomies were being done.

As surgeons continued to do ostomy surgery, there were ongoing improvements in the surgical techniques and the construction of a stoma. Surgeons had encountered many difficulties in constructing and securing a stoma to the skin, resulting in problems with viability of the stoma mucosa, inflammation and poor healing. The attachment of the stoma to the abdominal wall was not always secure, resulting in retraction of the stoma below the skin level. There was early recognition that improperly constructed stomas were a problem for patients and created difficulties in management (Silvers, 1940). Brooke (1952) perfected a technique, still in use today, of constructing a stoma which reduced the incidence of stenosis and retraction of the stoma in the post-operative period, thus providing long-term benefits for patients. According to Brooke and Walker (1962) "construction of an efficient ileal stoma is the keystone" (p.401). Today, there are surgical techniques available when a difficult construction of a stoma is anticipated (Kittur, Talamini, & Smith, 1989; Light, 1992), or when necrosis, retraction or stenosis of the stoma necessitates repairs (Doberneck, 1991).

Improvements in surgical techniques have significantly increased the quality of life for many patients who require ostomy surgery (Smith & Babaian, 1989). The new and reliable anastomosis methods available eliminate the need for an ostomy previously done for bowel perforations due to trauma (Corman & Odenheimer, 1991). Today, patients with UC or familial polyposis who require surgical intervention, have alternative options, such as an internal pouch, rather than the traditional total proctocolectomy and Brooke ileostomy. The surgical creation of an internal pouch may provide patients with continence (Becker, et al., 1991; Jagelman, 1990; Madden et al., 1991).

The internal pouch is not recommended for individuals with Crohn's disease due to the potential recurrence of the disease anywhere in the gastrointestinal tract (Deutsch, McLeod, Cullen, & Cohen, 1991; Hyman, Fazio, Tuckson, & Lavery, 1991; Pezim, et al, 1989).

The Issue of Incontinence

A major negative aspect of an ostomy is the loss of bowel control, resulting in incontinence. Management of an ostomy has and continues to be, primarily directed at maximizing control or containment of bowel effluent and minimizing peristomal leakage.

Dietary management. An early method of trying to achieve continence was with a variety of dietary restrictions, such as a bland diet, reduced residue and fats, no seeds, and pureed foods. Dukes (1947) even recommended restricting fruit and vegetables. The goal of these restrictions was to cause constipation (Cattell, 1933; Druckerman, 1938; Gabriel & Lloyd-Davies, 1935; Shedden, 1932). Dubois (1936) felt a decrease in the amount of food consumed was beneficial, and that individuals with smaller appetites had an advantage. If dietary restrictions were not successful, some physicians also recommended the use of opiates and other drugs to promote constipation (Dubois; Druckerman). Druckerman also recommended the use of sedation for nervous persons. At all costs, intestinal irritation was to be avoided. Those individuals who were incontinent were believed to be careless in their diets, undisciplined and lacked control (Babcock, 1939).

The emphasis on controlling an ostomy with dietary measures persisted for many years. As late as 1971, Rowbotham addressed this issue by simply stating that it was absurd to try and control a colostomy when there is no anal sphincter. Rebuffat, et al. reiterated this in 1983. It is interesting to note that during my practice many patients were under the impression that they would need to make major changes in their dietary habits.

Irrigation. A second, often recommended, method of controlling incontinence, was irrigation, using one to two quarts of warm water or normal saline to flush or evacuate the colon (Cattell, 1933; Dubois, 1936; Gabriel & Lloyd-Davies, 1935; Jones & Kelm, 1946; Silvers, 1940). Using a Freudian framework, the use of irrigation is viewed, by some individuals, as a means to regain anal control (Orbach, Bard, & Sutherland, 1957).

Jones and Kehm (1946) advocated irrigation because pouches were malodorous, and contributed to peristomal hernias and prolapse of the stoma due to suction. Irrigation continues to be popular and successful as a means of control, and is used by many individuals with a colostomy in the left colon (Laucks, et al., 1988; Meyhoff, Anderson, & Nielsen, 1990; Venturini, Bertelli, Forno, Grandi, & Dini, 1990). Recently, the use of a cone tip to direct fluid into the stoma has reduced the risk of perforation (Giunchi, Cacciaguerra, & Drudi, 1985).

Ileoanal anastomosis. In some cases an ostomy was avoided. Aylett (1966) advocated an ileorectal anastomosis for diffuse UC. However, this did not always eliminate the disease as the rectal mucosa remained. Today, through the meticulous and painstaking work of several surgeons, there are a variety of new techniques which provide alternatives to an ostomy and preserve continence, primarily for individuals with UC or familial polyposis (Becker, et al., 1991; Jagelman, 1990; Madden et al., 1991). The concept of these new procedures was to create an internal pouch for patients, so they would not need to wear an exterior ostomy pouch. The faecal effluent would be contained internally.

Kock pouch. The initial developments with this new concept were done by Kock. Using a segment of ileum, Kock created an internal pouch, now known as the Kock pouch. The pouch connects with the abdomen through a stoma and a surgically constructed nipple valve. Patients catheterize the stoma to empty the pouch of faecal contents and only need to cover the stoma with a dry dressing (Kock, 1973). Initially the construction of the nipple valve presented many difficulties and the resulting incompetent valves prohibited continence. With improvements in constructing the nipple valve, the concept of a Kock pouch offered "relief from inconvenience, unsightliness, and all-too-frequent accidents associated with external stoma pouches" (Cassell, 1984, p. 48).

Individuals with a Kock pouch, or continent ileostomy, were more often very satisfied with their lives, as compared to people who had a conventional ileostomy (Keltikangas-Jarvinen & Jarvinen, 1987). Nilsson, Kock, Kylberg, Myrvold, and Paiselius (1981) found that individuals with a Kock pouch had improved sexual relationships without the risk of leakage, odour, noise and the physical presence of an external pouch.

Internal Reservoirs. Further developments of an internal pouch came from other surgeons who, when creating the pouch, folded the ileum in different patterns to create an internal reservoir. The intent was to connect the reservoir with the anal sphincter and eliminate the need for an external stoma, thus preserving the physical body image although not the original functional body image.

With an ileal pouch anal anastomosis, patients have one of three types of pouch; J, S or W pouch. The letter designation reflects the different techniques for creating the pouch. Depending on how the ileum is folded, cut and resutured, the final result resembles one of the three letters. Which procedure is done depends on a surgeon's personal preference and training (De Silva, et al., 1991; Everett, 1989; Galandiuk, Wolff, Dozois, & Beart, 1991; Harms, Pahl, & Starling, 1990; Poppen, et al, 1992). Complete success or total continence, with this procedure has been attained for a majority of patients. A few have only nocturnal incontinence and/or urgency. A few are totally incontinent and have an abdominal stoma created (Barnett, 1989; Bernard, Morgan, Tasse, & Wassef, 1989; Coran, 1990; Everett; Fazio & Church, 1988; Harms, et al., 1990; Keighley, Winslet, Flinn, & Kmiot, 1989; Nicholls, 1987; Pemberton, Phillips, Ready, Zinsmeister, & Beahrs, 1989; Skarsgard, et al., 1989; Taylor & Dozois, 1987; Wexner, Wong, Rothenberger, & Goldberg, 1990). When difficulties in achieving total continence have been experienced, there has also been an associated incidence of sepsis (Keighley, et al., 1989).

Several patients with a conventional ileostomy have had it converted to an internal pouch. Many of these individuals have indicated they have a better quality of life with this surgical procedure. (Barnett, 1989; Coran, 1990; Myrvold, 1987; Pemberton, et al., 1989; Pescatori & Mattana, 1990; Porter, Salvati, Rubin, & Eisenstate, 1989; Skarsgard, et al., 1989; Sugerman, Newsome, Decosta, & Zfass, 1991; Vasilevsky, Rothenberger, & Goldberg, 1987; Wexner, et al., 1990). Today, experience with these new procedures has confirmed they are an excellent alternative for patients with chronic UC (K.A. Kelly, 1992) as well as familial polyposis (Ambroze, Dozois, Pemberton, Beart, & Ilstrup, 1992; Launer & Sackier, 1991; Miller, Ferguson, Amerson, Dobkin, & McGarity, 1991). Even with these new procedures, continence is not always 100 percent. Therefore, it is essential for surgeons to disclose all possible implications of a proposed surgical procedure preoperatively (Wexner, Jensen, Rothenberger, Wong, & Goldberg, 1989). Although some believe the presence of a stoma or faecal incontinence impair the quality of life (Kohler, Pemberton, Zinsmeister, & Kelly, 1991), for some individuals with ulcerative colitis the quality of life is high following surgery, irrespective of the type of surgery performed, conventional ileostomy, Kock pouch or ileoanal reservoirs (McLeod, Churchill, Lock, Vanderburgh, & Cohen, 1991).

Recent Developments. The trend towards avoidance of an ostomy and having secure continence continues today for other patients. Surgeons are exploring ways to spare the anal sphincter when adenocarcinoma has developed in the lower rectum (Bernard, et al., 1989; Rosenthal, et al., 1992; Steele, et al, 1991). There have also been developments towards creating a seal for colostomy stomas (Cerdan, Diez, Campo, Barbero, & Balibrea, 1991; Clague & Heald, 1990; Satava & King, 1989), and in some cases when a seal is used, placing the stoma in the perineal area (Fedorov & Shelygin, 1989). For individuals who had a proctectomy, surgeons are creating a neorectum and neoanal sphincter using the gracilis muscle (Williams, Hallan, Koeze, & Watkins, 1989). Although various alternatives to ostomy surgery have been developed, for many individuals, there is no option.

The alternatives to having an ostomy provide many patients with a potential for less psychosocial trauma which has always been associated with an external ostomy and loss of bowel function. If a person does not have this alternative, or did have an internal pouch and needed to have it removed, adjustment may be a more difficult process. However, in exploring the quality of life for patients who had UC, and who had one of three surgical procedures, a conventional ileostomy, Kock pouch or an ileal anal reservoirs, the type of surgery was found not to be a significant factor (McLeod, et al., 1991).

Ostomy Pouches

The issue of loss of bowel control and problems with skin excoriation have always been concerns associated with an ostomy. The management of the effluent from an ostomy has revolutionized over the years. Today people can live without fear of the unpleasant odour associated with faecal material and flatus, with healthy peristomal skin, free of infection and pain, and in many cases without fear of peristomal leakage (Roberts, 1987).

Initially, due to the nature of effluent, preventing skin breakdown was more easily accomplished with a colostomy, especially if it was from the left side of the colon. The effluent from an ileostomy is never thicker than toothpaste, and often has digestive enzymes. Thus, with an ileostomy, preventing skin breakdown without successful containment of the effluent, was nearly impossible. As a consequence, for several years, although colostomies were being created, the surgical creation of an ileostomy was avoided unless there was no alternative.

In the 1920s and 1930s, the use of any type of ostomy pouch was discouraged and even forbidden by some physicians. Those people who used a pouch were considered the *unfortunates* and wearing a pouch implied defeat, since the person was considered not disciplined enough to follow a strict diet. Pouches were also discouraged since it was thought that a pouch caused a prolapse of the stoma and/or peristomal hernias (Druckerman, 1938; Dukes, 1947; & Turnbull & Michels, 1952). A dressing with vaseline or oiled silk (Druckerman) or a square pad of absorbent cellulose wadding with a piece of linen or gauze smeared with vaseline was recommended as coverings for the stoma (Dukes).

Not everyone however, was in agreement with these recommendations. As early as 1926, Stebbing advocated that patients with a colostomy should use a cup-like container which could be secured with a belt and used with or without an abdominal pad. The cup helped to contain any spillage of stool and thus prevented skin excoriation. Today in developing countries, where health care resources are scarce, the use of a tin can with an attached plastic bag is recommended for management of an ostomy (Meier & Tarpley, 1991)

The earliest documentation of a pouch for an ileostomy was by Plumley (1939). For many years, ileostomy surgery was delayed as long as possible due to the difficulties in managing the bowel effluent from the stoma. As a patient with an ileostomy, Plumley was discouraged with leakage and the resulting painful skin excoriation. To achieve the aim of healthy skin, he experimented until a suitable pouch was found which provided him with security from leakage and eliminated his painful skin excoriation. Plumley, in effect ushered in a new trend, the wearing of an ostomy pouch. He demonstrated that pouches can have a positive impact on a patient's life.

Soon after Plumley developed a secure pouch it was recognized that such pouches gave confidence to people who have an ostomy (Jennings, 1941). The early pouches, made of semi-permanent rubber had a lifespan of approximately six months, and adhered to the skin with various adhesives. Individuals often had two or three pouches, and alternated them to allow for airing. This was important as the rubber disintegrated and it was difficult to eliminate the odour completely with washings and/or deodorizers. Thus, even with the effluent more securely contained, as opposed to a dressing, odour continued to be a problem.

For many individuals the new pouching system was secure and skin problems were eliminated. However, several individuals developed sensitivities and skin allergies to the resins contained in the adhesives. Newer, gentler and non-abrasive skin barriers were developed which effectively adhered to the skin without causing as many allergies (Donaldson, 1963). With new secure pouches, it was felt that when itching and discomfort did occur, it was usually from peristomal leakage (Wilson, 1964).

In the last thirty years, with the development of sophisticated plastics and skin barriers, there has been a major evolution in pouching systems available for people with an ostomy (Bokey & Shell, 1985; McLeod, et al., 1986). Fundamental improvements included the resistance of the new plastics to odour and the soft pliable skin barriers.

It is essential that a pouching system provide freedom from leakage and unpleasant odours for at least twenty-four hours (Kretcshmer, 1978), preferably a minimum of three to four days. In addition, it must allow for ease of movement and comfort. According to Edington and Lotze (1987), "psychologic acceptance of the stoma is related to the comfort and reliability of a functional appliance" (p.382).

Psychological and Sociological Perspectives

It is a perplexing task comparing studies which examine the quality of life for individuals who have an ostomy, as there is no common definition for the complex construct of *quality of life* or normal lifestyle in this literature. Daly (1968) felt it was important to address quality of life issues, if ostomy surgery was going to continue to be advocated for patients. Devlin, Plant & Griffin (1971) also identified a need to focus on the quality of life for persons with an ostomy, as it was not enough to just save their lives. However, given the differences related to the various reasons for having ostomy surgery, meeting individual psychosocial needs is a challenging task.

For those with familial polyposis or cancer, ostomy surgery can be a cure. For other individuals, a fear of recurrence of cancer may influence all aspects of adjustment (Druss, O'Connor, & Stern, 1969). Individuals with cancer, or who have experienced trauma, usually do not have a long history of feeling unwell. Having ostomy surgery is personally devastating and for those individuals with cancer, it is additional overwhelming news. In a study by Oberst and Scott (1988), patients who had ostomy surgery for cancer experienced a slower psychological recovery following surgery as compared to a group of patients who had surgery for cancer but did not have an ostomy.

Although preoperatively, concerns about the ostomy pouch and changes in body image are significant, for many individuals with chronic inflammatory bowel disease there is a more positive sense of body image following ostomy surgery (Drossman, Patrick, Mitchell, Zagami, & Appelbaum, 1989). This is associated with the improved sense of well-being which comes following the removal of diseased colon, and possibly years of being ill (Bell, 1989). However, for those individuals with Crohn's disease, it may only be a temporary measure. Beahrs (1971) found that for patients who had an ileostomy, life improved and was better than living with the disease which precipitated the ostomy surgery.

In the past it was felt that ostomy surgery was a *handicap* with which a person had to learn to live (Dubois, 1936). The concept of a handicap was related to the lack of bowel control caused when an ostomy was created. To help an individual become "an inoffensive member of society" (Binkley, 1929, p.71), attempts were made to control an ostomy.

Many of the social attitudes regarding ostomy surgery have not varied a great deal over the years (Foulis & Mayberry, 1990). The attitude, that excretion as a discussion topic is taboo, remains widespread (Alderman, 1987; Mahoney, 1976), even amongst nurses (Reed, 1989). Some individuals with a colostomy feel they violate the social codes of cleanliness (Druss, et al., 1969). In some places, patients with an ostomy were separated from other patients during meals (Devlin, et al., 1971). According to Martinsson, Josefsson and Ek (1991), following ostomy surgery, individuals feel handicapped and may isolate themselves.

There is extensive documentation of many individuals' fears of peristomal leakage and the influence of this on participation in social activities outside the home (Burnham, Lennard-Jones, & Brooke, 1977; Devlin, et al., 1971; Morrow, 1976; Prudden, 1971) and sexual relationships (Brouillette, Pryor, & Fox, 1981; Burnham, et al., 1977; Gloeckner, 1984; Lamb, 1990). With spillage, individuals experience severe humilation (Sutherland, Orbach, Dyk, & Bard, 1952). According to Druss, O'Connor, Prudden and Stern (1968), it is only when patients feel in relative control of their "bowel function and accidents are virtually eliminated that any measure of peace of mind can be achieved" (p.58).

The modern changes in surgical techniques and ostomy management have facilitated adjustment. As individuals gain control of the bowel effluent, they begin to feel more confident and resume vocational and social activities (Bone & Sorensen, 1974; Morowitz & Kersner, 1981; Wirching, Druner, & Herrmann, 1975). Ostomy surgery does not have to mean the end of social relations, "it can be a new beginning....a second chance" (Belgiorno, 1989, p.40A). In an early study by Roy, et al. (1970), 92 percent of 497 patients indicated they were satisfied with their way of life and 47 percent said life was normal.

McLeod, et al. (1986) found that, for a group of patients with an ileostomy, the process of achieving a positive quality of life involved a multitude of factors, including physical and emotional well-being, as well as lifestyle intentions including diet, social activities, and work. For many individuals, having an ileostomy did not interfere with their social activities (Foulis & Mayberry, 1990). However, unless psychological and social issues are directly addressed, crucial and primary needs are not fulfilled (Wade, 1990).

Changes in Body Image

Body image is part of an individual's personal perception of physical self and is influenced by social attitudes and expectations. When individuals have an ostomy, they may perceive it as stigmatizing due to the lack of bowel control. With time and aging, our body image changes. However, a sudden illness or surgery causes an abrupt change in body image and is more difficult to come to terms with than the changes which occur with aging (Gawron, 1989). "Sudden illness resulting in hospitalization and ostomy surgery is particularly stressful" (Coellen, 1989, p.179). Preoperatively, when there is minimal or no time for a patient to prepare for ostomy surgery, postoperative adjustment is affected (Coellen).

With the creation of an exterior stoma on the abdomen there is an abrupt physical change as well as a change in elimination function. Elimination is a very private and intimate affair, especially bowel elimination. It is not a topic for dinner conversation and, for many individuals, it raises feelings of shame and embarrassment (Bond, 1990). It is common for individuals to experience negative feelings when first viewing the ostomy. For some persons, it is as if the stoma was not a part of them. These feelings of shock and repulsiveness initially prohibit participation with self-care (Foulis & Mayberry, 1990). If these feelings persist, there are long-term problems with adjustment.

Sexuality. The personal view one has of self influences sexuality and sexual relationships. The presence of an external stoma may contribute to discomfort in sexual relations due to an altered self-image (Brooke, 1980; Brouillette, et al., 1981; Gloeckner, 1983; Gloeckner & Starling, 1982; Gutman & Reiss, 1985; Kennedy, 1988; Rolstad, Wilson, & Rothenberger, 1983; Shipes, 1987b; Snow, 1980; Wabrek, Wabrek, & Burchell, 1980). Although sexual dysfunction may be psychological, it can also result from nerve and tissue damage during the surgery (Brouillette, et al.; Shipes; Wabrek, et al.).

Fear of Leakage

It has long been recognized that problems associated with stoma management can create psychological, social and mechanical difficulties (Baker & Harocopos, 1983; Morrow, 1976; Nahra, 1977). The first incidence of leakage reinforces the loss of bowel continence (M.P. Kelly, 1985). Spillage of bowel effluent, or incontinence, is extremely embarrassing. Secor (1954) describes the person who is fearful of spillage, as an "amputee without a crutch" (p.642). Druss, et al. (1969) identified the fear of being repugnant and feelings of shame about the possibility of leakage as common factors in individuals who have an ostomy.

Years ago, leakage was identified as a negative factor in adjustment and, for many individuals, it prohibited participation in social and vocational activities (Wakely, 1943). Peristomal leakage continues to be a significant problem and is often cited as a pivotal reason for limiting social, sexual and vocational activities (Burnham, et al., 1977). In fact, fear of leakage has led some individuals to become social recluses. Thus, the fear of peristomal leakage has always been, and remains today, a significant detrimental factor in the process of adjustment to an ostomy (Houghton & Steele, 1983; Pearcey & Black, 1987).

Freedom from peristomal leakage, and other sensory phenomena related to the stoma, has a positive impact on individuals' body satisfaction. When there are problems with the sight, sound, odour and feel of the ostomy, a person's body satisfaction is diminished (McLeod, et al., 1985) and the incidence of depression increases (Klopp, 1988). Many of the causes of peristomal leakage have been identified, and although it is a negative factor in the adjustment process and predisposes to social isolation, the overall impact of multiple leakage incidents in an individual's life is not reported (Kennedy, Lee, Claridge, & Truelove, 1982; Roy, et al., 1970; von Smitten, Husa & Kyllone, 1986; & Whates & Irving, 1984).

Today health care professionals assist patients who have ostomy surgery to return to a way of life that is personally important to them. No longer is survival of the operation enough (Secor, 1954). It is hoped, with changes in ostomy management, that the dark ages of stoma care are gone (Lenneberg, 1971; Secor, 1954; & Turnbull & Michels, 1952). The goal today, is for people to resume their former patterns of living, which helps prevent psychological problems, and promotes acceptance and adjustment to having a stoma (Elcoat, 1986). Ostomy surgery is intended for living, with freedom from disease.

Successful rehabilitation following ostomy surgery is a complex process and dependent upon being able to manage the ostomy and leakage problems (Alterescu, 1985; Bierman, Tocker & Tocker, 1966; Mahoney, 1976; McLeod, et al, 1985; Rowbotham, 1971; Shipes, 1987a). Although, an ostomy involves a significant change in body image and function, a person can learn to feel confident with the management of the ostomy and be assured that embarrassing accidents such as leakage of stool, will not happen (Rowbotham, 1974). With the advent of new skin barriers and pouches in the last two decades, improvements in surgical techniques, plus an increased use of preoperative selection of stoma sites, leakage and subsequent excoriation can no longer be condoned (Karlstrand, 1977; Walker & Pringle, 1964).

Stoma Site Selection

Rehabilitation begins preoperatively with the selection of a stoma site (Nahra, 1977). "Incorrect positioning of the stoma may deny the patient a return to normal life and plague him with ileostomy disability" (Sparberg, 1971, p.11). As early as 1938, the location of a stoma was identified as a major source of difficulty for people who had ostomy surgery (Dubois). As Brooke (1957) states, "the success or failure of treatment rests almost entirely on the stoma" (p. 406). In fact, the Japanese Society of Stoma Rehabilitation believed that stoma site marking was so important, they made it the central theme of their 1988 conference (Anazawa & Sakurai, 1989).

Today, the preoperative selection of a suitable location for a stoma, even when there is only a possibility of an ostomy (Gillen & Peel, 1986; Kretschmer, 1978; Leenen & Kuypers, 1989), is considered essential for ease of management and security from peristomal leakage (Greif, Dreznick, & Jacob, 1990; Winslet, Barsoum, Pringle, Fox & Keighley, 1991). It is abundantly documented that a well planned stoma facilitates a patient's adjustment and helps prevent peristomal leakage (Brooke, 1952; Celestin, 1986; Coellen, 1989; Fussell, 1976; Gawron, 1989; Goligher, 1978; Hill, 1976; Jagelman & Reeves, 1973; Jeffries, 1986; Jennings, 1941; Kennedy, 1988; Leenen & Kuypers; Lyons, 1965; MacKenzie, 1965; Mahoney, 1976; Nahra, 1977; Ray, Hanley, & Hines, 1964; Rowbotham, 1971). According to Kennedy (1988), a "better understanding of the optimum siting of the stoma, has improved the quality of life and capacity for work" (p.178).

Although the process of stoma site selection is individualized for each patient, several common factors need to be considered when selecting a stoma site. For most individuals a compromise can be reached to meet specific needs. Patient teaching is then individualized to meet the specifics of a stoma site selection.

The lifestyle and ability for self-care of each person is assessed (Mahoney, 1976; Rowbotham, 1971; Williams, Nasmyth, Jones, & Smith, 1986). Self-care of an ostomy is facilitated when the stoma is within a patient's line of vision, as it is easier to centre the ostomy pouch (Boarini, 1985; Elcoat, 1986; Jeffries, 1986; Todd, 1978). If a pouch is not centred over the stoma, effluent may leak under the base of the pouch, causing lifting and spillage. To ensure that the stoma is within a person's line of vision, an assessment is made for protrusions which may impair visibility of the stoma (Jeffries). For example, people who use a wheelchair may need to have a stoma placed higher so it is visible when sitting (Watt, 1986). Additional assessments are made for physical ability, as well as hand and eye coordination. A person may not be able to reach one side of the abdomen. Siting the stoma so it is within the line of vision and reach may only be feasible using the alternate side of the abdomen.

After a person's vision and physical movement have been assessed, other factors are considered before a final choice for the stoma site is made. There is an emphasis on sites which will not interfere with the adherence of a pouch. Thus, an attempt is made to eliminate potential peristomal leakage sources (Streza, Laing & Gilsdorf, 1977). There is agreement in the literature that bony prominences, scars, wrinkles, creases, and the umbilical area are to be avoided when selecting a stoma site in adults (Celestin, 1986; Dicus, 1974; Ray, et al., 1964; Rowbotham, 1971; Shedden, 1932; Sivly, Todd, Wentworth, Pemberton, & Dozois, 1985; Walker & Pringle, 1964; Wilson, 1964). A smooth area of skin which will not be interfered with by physical movement is preferred (Celestin, 1986; Elcoat, 1986; Goligher, 1978; Hill, 1976; Hughes, 1976; Jennings, 1941; Jeffries, 1986; Mahoney, 1976; Nahra, 1977; Rowbotham, 1971; Todd, 1971).

At one time, a specific place on the abdomen was favoured, for example, three to four centimetres between the iliac crest and umbilicus was considered the best stoma location (Flannery,1960; Moore, Wallace & Freudlich, 1966). This practice has been rejected as individual needs became all too apparent. No two people have identical abdomens nor do they wear their clothes in the same way. Therefore, belt lines, backbraces or corsets need to be considered as does anything which may interfere with the adherence of the pouch (Elcoat, 1986; Green, 1966; May, 1977; Nahra, 1977; Sivly, et al., 1985; Stevens & Dent, 1976; Walker & Pringle, 1964; Watt, 1986).

To reduce the incidence of peristomal hernias, the stoma is located opposite the rectus muscle (Mahoney, 1976). All criteria need to be considered for lying, standing, bending, sitting or twisting positions (Celestin, 1986; Hill, 1976; Jeffries, 1986; Kretschmer, 1978; Watt, 1986).

Other Factors Related to Peristomal Leakage

It is not always possible to eliminate peristomal leakages with preoperative stoma site selection. Leakage problems have been linked to the physical appearance of the stoma (Gruner, et al., 1977; Saunders, 1971; Todd, 1978). It is thought that when the stoma is above the skin level, there are fewer occurrences of leakage, since the bowel effluent drains directly into the pouch and not between the skin and the pouch (Gruner, et al.; Jeffries, 1987). However, it may be difficult to create a protruding stoma. The patient may have a thick abdominal wall or the surgeon may not be able to safely mobilize the bowel and preserve the vascular integrity. People, who have been ill with inflammatory bowel disease, may have lost weight. It is difficult to evaluate just how much weight they will regain following surgery and how that weight will be redistributed over their bodies. A weight gain may cause a stoma to become flush or retract from the skin surface. Peristomal leakage is the most common problem associated with these types of stomas (Boarini, 1985; & Jeffries).

A regular schedule for changing is needed to reduce the potential for peristomal leakage and the inevitable consequence of skin excoriation. The schedule must be individualized for each person. For example, if a pouch leaks every four days, it should be changed every three days (Smith, 1985; & Wilson, 1964). If the pouch is left on indefinitely, leakage will occur (Gruner, et al., 1977; Streza, et al., 1977). Once the integrity of the skin is breached, it becomes increasingly difficult to obtain a seal of the pouch. Without a seal, it is next to impossible to heal the skin (Donaldson, 1963; Jeffries, 1986; Karlstrand, 1977; Wilpizeski, 1981). In all cases of peristomal leakage, skin excoriation will occur. Resiting of the stoma may become the only remedy for the peristomal leakage or hernia (Jeffries). The creation of an ostomy must be compatible with a normal lifestyle (Hill, 1976).

Self-Care and Independence With Ostomy Management

Unless individuals are independent with the care of the stoma, they are economically, psychologically, and socially disabled (Lyons, 1965). The relationship between the factors affecting peristomal leakage and an individual's ability to manage the self-care of an ostomy is not addressed in the literature. From this investigator's perspective, the basic care of an ostomy is a technical skill. Removal of a pouch, cleansing of a stoma, and application of a new pouch are tasks which do not require a significant amount of knowledge. They can be learned by demonstration and practice.

Learning self-care of an ostomy is done postoperatively, and in Alberta, up until recently, prior to discharge from hospital. Thus, the length of hospitalization following surgery was determined by how much practice a person needed to become independent with self-care. Ewing (1989) believes it is vital that patients are not discharged from the hospital until they are proficient with their ostomy care. However, a recent trend towards earlier discharges following surgery precludes this requirement. This is a significant change, as the physical management of an ostomy can be problematic for patients with cancer. Oberst and Scott (1988) found that patients with an ostomy took longer to return to their presurgical function and experienced more psychological distress.

A person's ability to come to terms with the reality of an ostomy may also affect self-care of the stoma. The reaction of people who have inflammatory bowel disease differs from those who have cancer. For the former, the ostomy is often not a new reality and may even be a relief from long-standing disease. However, for those individuals with cancer, they are confronted with two devastating concepts at once, a life-threatening disease and an ostomy. These individuals need to come to terms with the diagnosis of cancer initially, then with the reality of an ostomy. Thus, the adjustment process and the learning of self-care may be delayed for those individuals who have a malignant disease (Winkler, 1986).

Summary

Not all individuals have a choice of alternatives to having an ostomy. Of those individuals with a bowel disease, only persons with UC or familial polyposis are candidates for an internal pouch. The option of having an internal pouch is an individual one and some choose ostomy surgery. To date, the reasons why individuals are making these different choices has not been explored. There is a potential for leakage with both surgical procedures. However, although bowel control is lost with both operations, a significant and visible physical change in body image is only associated with an ostomy.

Ostomy surgery is intended to free an individual from disease or pain, not to be a burden. A lack of peristomal leakage ensures security for these individuals, when there is a loss of normal bowel control. Freedom from peristomal leakage and independence with self-care of the stoma enhances psychological well-being and promotes social interaction.

The location of the stoma site has been recognized for several years as being important. The use of ostomy pouches requires a smooth area of skin around the stoma to ensure a secure adherence of the pouch. In addition, the adherence of an ostomy pouch must not be interfered with by body movements, clothing or a prosthesis. Self-care of the stoma is facilitated when the person can see and reach the stoma to apply the pouch (Brooke, 1957; Dubois, 1938; Jeffries, 1987; & Nahra, 1977). A secure pouch will not leak if a regular change schedule is maintained (Smith, 1985; & Wilson, 1964). The reliability and validity of the criteria for selecting a stoma site preoperatively have not been evaluated.

The final appearance of a stoma cannot always be predicted. On occasion a weight gain, vascular damage, poor healing or a peristomal hernia may cause changes in the stoma appearance and surrounding skin, potentiating the risk of peristomal leakage.

The goals of ostomy surgery and enterostomal therapy nursing are to help individuals achieve freedom from peristomal leakage and to promote independence with self-care, thus enhancing psychological and social well-being.

CHAPTER THREE

Methods and Procedures

The main objective of this study was to examine the nursing practice of preoperative stoma site selection, using specified criteria, to reduce the incidence of peristomal leakage for individuals having ostomy surgery involving the colon or ileum. A review of the literature confirmed that peristomal leakage is a significant problem for individuals having bowel ostomy surgery, and influences personal adjustment to having an ostomy. Thus, a second objective of this study was to explore the possibility of a relationship between the incidents of leakage and the level of confidence an individual feels about resuming preoperative daily activities following ostomy surgery involving the bowel. It was believed that the best way to find out if individuals are feeling confident, was to ask them. Evidence of the type of stoma, physical status of the stoma, reason for surgery performed, weight, and presence of disabilities as well as the number of incidents of peristomal leakage and relevant demographic data was collected.

Design

Although certain criteria for selecting a stoma site have been suggested in the literature, the reliability or validity of these criteria have never been evaluated. It was also unknown which of these criteria were used in general practice by ET nurses. Before commencing this study it was essential to determine the standard criteria used by practising ET nurses when selecting a stoma site. A questionnaire was sent to 30 practising American and Canadian ET nurses requesting information on the criteria they used in their practice (see Appendix A). The results of this questionnaire became the criteria used by all nurses who marked stoma sites for participants in the study (see Appendix B).

The ET nurses who participated in this study, have several years of clinical experience, and have used the same criteria in their practice prior to the initiation of the study. Therefore, the assessment of a stoma site was not a newly learned skill, nor were the criteria used new to their practice. Each ET nurse had graduated from a recognized educational program for enterostomal therapy nursing and had been practising for at least three years.

A descriptive comparative design was used for the study, as randomization of subjects and manipulation of the independent variable, preoperative stoma site selection, were not within the control of the researcher. Since extraneous influences can be a problem with this type of design (Smith & Glass, 1987), the sample was restricted to a selected group of participants. It was intended that the demographic data collected would direct the analysis and therefore, limit the risks associated with misinterpretation.

Sample

Participants in this study were adult patients who had bowel surgery with an associated ileostomy or colostomy at one of four major tertiary care hospitals located in one of two major urban centres on the Canadian Prairies. The 43 general surgeons practising at these institutions were contacted (see Appendix C). Written permission was received from 34 surgeons for the ET nurse to approach their patients postoperatively to determine if they were interested in participating in the study (see Appendix D). If a stoma site was to be selected preoperatively, the surgeon consulted a member of the enterostomal therapy department located in each hospital. A registered nurse from that department then did an individual assessment, and selected and marked a preferred site for the stoma on the patient's abdomen.

All of the hospitals selected had an active enterostomal therapy department which had been in place for a least 10 years. The six ET nurses from all of the hospitals agreed to participate in the study and to follow common criteria (see Appendix B) when selecting a stoma site preoperatively for all patients. Patients who met the selection criteria were approached by an ET nurse during the postoperative period, usually five to seven days after surgery, to ask if they were interested in participating in the study. Patients with surgical complications of infection and/or respiratory distress were not approached as early as these individuals initially had poor stamina and limited amounts of energy. At the beginning of the study, there were few participants due to the fact that not all patients were approached by the ET nurses. Initially, the ET nurses occasionally forgot to ask potential subjects. There was also some preselection, as to who would be a good subject for the study. At two of the hospitals, when there were additional requests to access this particular patient population for other research projects, everyone who met the criteria was asked if they were interested in participating.

Access to Sample

All members of the sample were initially approached by the ET nurse in the hospital where they had the surgery. If a patient was interested in possibly participating in the study, the ET nurse left an information letter (see Appendix E) and contacted the researcher or research assistant. The potential participant was then personally visited in the hospital by the researcher or research assistant. The study was explained and all questions were answered prior to participants signing a written consent form (see Appendix F). They were given a copy of all questionnaires, the consent form and a second information letter (see Appendix G).

A convenience sample of 46 subjects was obtained over a period of two and a half years. Of these subjects, 34 had their stoma sites selected preoperatively and for the remaining 12 subjects, the stoma site was selected at the time of the surgery. All subjects met the selection criteria of not having previous ostomy surgery, being at least 18 years of age, and being able to understand, read, write, and speak English. A fourth inclusion criteria was experience in changing the ostomy pouch independently at least once prior to being discharged from the hospital.

It was hoped that comparable sized groups, preoperatively unmarked and marked, and in terms of cancer and inflammatory bowel disease, would be obtained. It is evident from the review of the literature that individuals with different disease conditions, such as inflammatory bowel disease (IBD) and cancer, vary in their adjustment to an ostomy. The incidence of IBD and cancer occur predominately in younger and older populations respectively. Thus, it was hoped that the confounding variables of adjustment and age could be controlled to some extent, by ensuring a similar distribution of disease conditions. This was not possible in this study due to the small sample size.

Setting

The initial contact with the subjects was in a hospital setting. Although participants were encouraged to call the researcher or research assistant at home if they had any questions, no one called. The final interviews were conducted in the patient's home by the researcher or research assistant for those individuals who lived within an hour's drive of the city's perimeter. For those individuals living beyond this distance, the final interview was conducted over the phone. The collection of data was done at times which were convenient to the participants.

Data Collection

A total of 55 visits were made to potential subjects in the hospital, 34 visits to subjects in their homes and 12 telephone calls to subjects who lived out of town. When contacted by the ET nurse, the researcher would arrange a time to visit the potential subject in the hospital. For a few individuals, two initial visits were made to the hospital because they were unexpectedly not feeling well on the first visit, and a second visit was arranged.

Each participant was given an explanation about each of the four data collection forms. The participant completed an information form (see Appendix H) in private while the researcher or research assistant accessed the participant's medical record to complete a second information form (see Appendix I). Following completion of the second form, the researcher returned to the participant to assist with completion of the first form. Participants were encouraged to complete as much of this form as possible as this provided the researcher with the subject's perspective of events. This was critical information, as it allowed the researcher to gain an understanding of the patient's interpretation of events and information received.

Each participant was given an envelope with six Peristomal Leakage Forms (see Appendix J) with instructions for completing these forms, if a leakage occurred when they were at home. An explanation of what was peristomal leakage was given. The concept of what constituted leakage was consistent with the information given to the participants by the ET nurses. The range of peristomal leakage forms used was zero to fifteen. The length of this hospital visit and interview averaged 40 minutes. The completed forms were placed in an envelope with the subject's code number on the outside and a *post-it note* indicating when to call to arrange for the final interview.

Participants were contacted by telephone to arrange the date and circumstances for the final interview. During this final interview, the peristomal leakage forms were collected and the participant was asked to complete a Recovery Satisfactory Questionnaire (see Appendix K). The participant was provided with an opportunity to elaborate on any further information they would like to provide regarding any leakage incidents or changes made in the pouch system being used since discharge from the hospital. The length of this interview averaged 45 minutes.

When data collection was completed for a subject, the information, minus the subject's name and address, was placed in an envelope with only the subject's code number on the exterior. The name and address were placed in a separate file.

Data Collection Instruments

All data collection instruments used in this study were developed specifically for the project. To ensure the readability of the forms and to determine how long it would take to complete each form, a second pilot study was conducted. Eight members of the Edmonton Ostomy Association participated in this study, as well as five ET nurses. They completed each form proposed for use in the study as well as a questionnaire about the forms (see Appendix L). Each participant found the forms easy to read and understand. No one suggested the addition of any other questions. The information about how long it took to complete the questionnaires was used in the informed consent forms.

The instruments in this study relied on individual responses. Thus, the validity of the questionnaires is dependent on the clarity of the statements and the accuracy of the respondents' self-reports. The content validity of the questionnaires was confirmed by ET nurses and individuals who have an ostomy. All of the questionnaires were colour-coded to facilitate data collection and allow participants to readily recognize the forms. A code-book with definitions for each question and numerical codes for all possible responses was developed to facilitate the scoring of data.

Biographical Information: Part A and Part B

Biographical information was gathered via a two part questionnaire. Part A was completed by the participants and Part B by the researcher or research assistant. Data concerning age, gender, disease, type of surgery and ostomy, pre and postoperative changes in weight, marital status, length of hospital stay, whether they had an ostomy visitor, and support/services available when discharged, was gathered. Information about the stoma, vascular status and whether it was retracted, flush or protruding in relationship to the surrounding skin was obtained. Many of the participants were able to indicate if the stoma site had been preselected. In all cases this was confirmed with the ET nurse when she contacted the researcher. On the two occasions when the ET nurse was unsure if the stoma site was in the specific site selected, it was confirmed by asking the surgeon who had constructed the stoma.

The questions in the *Biographical Questionnaires* were derived from information about the factors which influence or directly contribute to peristomal leakage problems. Information about support services was felt to be important in examining participants' confidence in resuming their former activities.

Peristomal Leakage Form

The *Peristomal Leakage Form* is a self-report questionnaire. Participants were asked to complete this form following each incidence of peristomal leakage for a period of six weeks following discharge from the hospital. Information on this form was important to help identify contributing causes of the peristomal leakage. It was also useful to determine if the pouch system being used by a participant was comfortable and practical. If a participant was having difficulty in applying a pouch, this could certainly contribute to peristomal leakage problems.

Recovery Satisfaction Questionnaire

The *Recovery Satisfaction Questionnaire* is a short questionnaire with only five questions. Adjustment to having an ostomy is a process which is ongoing. This questionnaire was designed to only document participants' confidence in resuming their former activities and satisfaction with their day to day circumstances. A five point Likert type scale was used to record answers, which ranged from strongly agree to strongly disagree. The midpoint of the scale was labelled as agree.

This questionnaire was completed at the end of the six weeks following discharge from hospital. During the personal interview participants were given time to complete it. Several participants had completed it before the researcher arrived. Participants who were interviewed over the telephone, had a personal copy of the questionnaire which had been given to them during the initial interview. At the time of the telephone call, to arrange the final interview, the researcher ensured they had the form. Since the forms were colour coded, it was easy for subjects to identify the form being referred to by the researcher. If they had mislaid this form, the researcher would have mailed another copy to them, however, this was not necessary.

Data Analysis

Although the sample was not randomly drawn and application of the independent variable, selection and marking of a stoma site preoperatively, was not randomly applied, it had been hoped that within the sample there would be a fairly even distribution of subjects who had their stoma sites selected preoperatively and those who did not. The asymmetrical distribution of each group, and the low sample size restricted the analysis. A *Student t-test* was performed comparing the mean number of leakages for the group which had the stoma sited marked preoperatively with the group which did not. In addition, two *Student t-tests* were performed comparing the mean number of leakages for the marked and unmarked groups, for the subjects who had a protruding stoma, and for those with a permanent stoma. A two-way analysis of variance (ANOVA), with the independent variables of preoperative stoma site selection and the final appearance of the stoma with the dependent variable of peristomal leakage, was not done due to the minimal number of subjects within some groups. Correlation values were obtained for all questions asked in the *Recovery Satisfaction Questionnaire* and the incidence of peristomal leakage. In chapter four, descriptive statistics are used to describe all characteristics and findings of the study.

Ethical Considerations

The ethical guidelines established by the Canadian Nurses Association (1983) were used to develop this project. Ethical approval for the study was received from the University of Alberta, Faculty of Nursing Ethics Review Committee, as well as the ethics review committees for the Royal Alexandra Hospital and University of Alberta Hospitals in Edmonton, Health Sciences Centre and St. Boniface General Hospital in Winnipeg. Written approval was received from the Head of the Department of Surgery in each hospital and all participating ET nurses. Only patients of the surgeons who gave written permission to approach them, were questioned regarding possible participation in the study.

Those subjects who agreed to participate were informed about all details of the study, the questionnaires and their participation. Each participant was told that taking part in the study was voluntary and that their care would not be affected by their presence or absence from the study. Participants were also told they could withdraw at any time and that withdrawal would not jeopardize their care. Participants were aware that their identity was known only to the ET nurse and researcher or research assistant and that their responses to questionnaires were only available to the researcher or research assistant. All questionnaires were numerically coded to ensure anonymity. The written responses have been stored in a locked filing cabinet and will be destroyed at the completion of the study. Only the numerically coded data will be preserved.

A summary of the final results is to be sent to any of the following individuals who have expressed an interest: ET nurses accessed in the initial pilot study, members of the Edmonton Ostomy Association who participated in the second pilot study, participating ET nurses, physicians, research assistants, the research committees for all participating hospitals and subjects who participated in the study. Confidentiality of all individuals and details about individual institutions will be maintained. At no time will it be possible to identify individual participants, ET nurses, surgeons, or institutions.

The only risk for individuals participating in the study was related to breach of confidentiality, related to the sharing of personal information about a private intimate function. The researcher and research assistant were all familiar with ostomy surgery, and were sensitive to each individual's personal needs. A non-threatening approach was used with each person. During the personal interviews, at the beginning and the end of each participant's time in the study, the direction of the interview was taken from cues given by the participants.

Initially all participants in the study were made aware that should medical problems arise, the investigator would contact the physician after discussing this with them. Subjects did not experience medical problems during the study.

CHAPTER FOUR

Findings

A convenience sample of 46 subjects, from one of four tertiary care hospitals in two major urban centres, who had ostomy surgery for the first time, participated in this study.

Characteristics of the Sample

Reasons for Ostomy Surgery

The subjects, male and female, had a temporary or permanent colostomy or ileostomy for cancer, ulcerative colitis (UC), Crohn's disease, diverticulitis, obstruction or infection. There were no cases of familial polyposis or trauma. Although it was hoped, for comparative basis, that there would be an equal number of subjects within each category, or at least a similar distribution for cancer and inflammatory bowel diseases, *UC and Crohn's disease*, this did not occur. Many individuals who have ulcerative colitis may have an ostomy only temporarily or not at all. With the advent of successful surgery in the creation of internal anal reservoirs and continent ileostomies, individuals with UC have a temporary ostomy for a period of six weeks to three months. The distribution of the subjects by disease and gender is presented in Table 1.

For subjects who had cancer, there was no alternative to the ostomy surgery. All malignant tumours involved parts of the rectum, anal canal or both. For the majority of cancers occurring in this area, the leading possibility for a cure, is removal of the tumour. There is usually no other option if a cure is to be attained. Surgery for cancerous growths also entails removal of portions of the surrounding tissue. Thus, when cancer occurs so close to the anal sphincter, resection of the tumour encompasses some or all of the tissue of the anal sphincter. Therefore, an ostomy is a means of providing a mechanism for containing faecal effluent.

Table 1

Distribution of Diseases by Gender

Disease	Male	Female	Total	%
Cancer	13	10	23	50.0
Ulcerative Colitis	5	2	7	15.0
Crohn's Disease	3	3	6	14.3
Diverticulitis	3	2	5	10.9
Obstruction	0	2	2	4.3
Infection	0	2	2	4.3
Total	24	21	46	

Age

The range of age for all subjects was 21 to 85 years, with a mean age of 57.2 years. The majority of subjects who had the surgery for cancer were older, with a mean age of 67.7 years. The subjects with UC and Crohn's disease had a mean age of 41.7 and 35.2 years respectively. The complete distribution of ages and diseases is presented in Table 2.

Marital Status

The majority of subjects, 27 or 58.7 percent, were married. The next highest proportion, were those who were widowed, 10 or 21.7 percent. All subjects had strong family and social support systems available to them. In Table 3 the marital status of all subjects by gender is illustrated.

Table 2

Distribution of Subjects According to Age and Disease

	Range of Ages							
Disease	21-30	31-40	41-50	51-60	61-70	71-80	80 +	Mean
Cancer	0	0	1	4	8	9	2	67.7
UC	2	1	2	1	1	0	0	41.7
Crohn's	4	0	1	0	1	0	0	35.2
Diverticulitis	0	0	1	1	2	1	0	64.2
Obstruction	0	1	0	0	1	0	0	47.5
Infection	0	0	2	0	0	0	0	43.5

Table 3

Marital Status of Subjects by Gender

Marital Status	Female	Male	Percentage
Single	3	3	13.0
Married	9	18	58.7
Separated	0	1	2.2
Divorced	1	1	4.3
Widowed	8	2	21.7
Total	21	25	100

Ostomy Visitor

In both cities where this study took place, there is an active chapter of the United Ostomy Association, a well established self-help group with chapters world-wide. Both local chapters have an established visitor program, and the visitor coordinator works closely with the ET nurses. The visitor coordinator when contacted by an ET nurse arranges for a person with an ostomy to visit new patients. The visitor and patient are matched for gender and type of ostomy and as much as possible, for age and disease. Not all patients chose to have a visitor. Twenty-four of the subjects in this study did have an ostomy visitor during their hospital stay and 22 did not. The reasons why a subject did not have a visitor, or the benefits of a visitor as perceived by the subject, were not explored in this study.

Type of Surgery

All subjects in this study had extensive abdominal surgery. Nineteen subjects had abdominal perineal surgery, 9 had an anterior resection, 7 had a total colectomy, 3 had a total colectomy and internal reservoir, 5 had an obstruction relieved, 2 had a subtotal colectomy and 1 subject had a hemicolectomy.

For 26 of the 33 subjects who had colostomy surgery, the ostomy was permanent and for 7 subjects, it was temporary. When ostomy surgery is performed for a perforated diverticulum, trauma, obstruction or infection, it is usually only for a temporary period of time. After the infectious process is treated and the peritonitis has subsided, the ostomy is reversed, unless the surgical procedure is considered life-threatening for the individual. In this sample, several subjects who would otherwise have a temporary colostomy, experienced severe postoperative respiratory or cardiac complications, and the ostomy was considered permanent. One subject had perforated diverticula while in intensive care and receiving ventilator support. Two subjects elected to keep the ostomy rather than have it removed. Eight of the 13 subjects who had ileostomy surgery, had permanent ileostomies and five had temporary ostomies. Three subjects had temporary ileostomies while an anal reservoir healed. A complete distribution of the type of stoma, colostomy or ileostomy, permanent or temporary, by disease is illustrated in Table 4.

Table 4

Ostomy Status by Disease

	Colostomy		Ileostomy	
Disease	Permanent	Temporary	Permanent	Temporary
Cancer	22	1	1	0
Ulcerative Colitis	0	0	4	3
Crohn's Disease	0	2	3	1
Diverticulitis	3	1	0	1
Obstruction	0	2	0	0
Infection	1	1	0	0
Total	26	7	8	5

Preoperative Selection of Stoma Site

Seventy-four percent, 34 out of 46 subjects, had their stoma sites selected preoperatively, and 12 subjects had the stoma site selected at the time of the surgery. The distribution of types of stoma and whether it was permanent or temporary, and marked or unmarked preoperatively is illustrated in Table 5.

Incidents of Peristomal Leakages

A total of 21 subjects, 45.6 percent, experienced peristomal leakage problems. Of the group who had the stoma site selected preoperatively, 15 out of 34, or 44 percent of the group had one or more incidents of leakage. In the group who did not have the stoma site selected preoperatively, 6 out of 12 or

50 percent had one or more incidents of leakage. The mean number of peristomal leakages for each type of stoma, permanent or temporary, colostomy or ileostomy, marked and unmarked stoma sites preoperatively are illustrated in Table 6.

Table 5

Distribution of Types of Stomas and Preoperative Selection of Stoma Sites

	Colostomy		Ileostomy		
	Permanent	Temporary	Permanent	Temporary	Total
Marked	21	2	6	5	34
Unmarked	5	5	2	0	12
Total	26	7	8	5	46

Table 6

Stoma Type, Selection of Stoma Sites & Mean Number of Peristomal Leakages

	Colostomy		Ileostomy		
	Permanent	Temporary	Permanent	Temporary	All
Marked	1.4	0.0	1.2	4.4	1.7
Unmarked	2.4	1.2	2.0	---	1.8

The mean number of peristomal leakages in the group of subjects who had the stoma site selected and marked preoperatively was 1.7 leakages and for the unmarked group, the mean number of leakages was 1.8. The results of a t-test comparing the two means, (t value of -.16 with p-value of .876), were not statistically significant. However, this does not necessarily mean the null hypothesis is accepted. With the small sample size, the nonsignificant p-value does not necessarily provide support for the null hypothesis. The difference between the two means is clinically significant, and is indicative of possible benefits for patients when the stoma site is selected preoperatively using specified criteria.

The incidence of peristomal leakages for all permanent and temporary ostomies, for groups where the stoma site was or was not selected preoperatively, is illustrated in Table 7. The mean number of leakages for the individuals with a permanent stoma which was preselected, was 1.3, while the mean for the unmarked stomas which were permanent was 2.3. While the results of a t-test comparing these two means, t-value of -1.15 and p-value of .258, were not statistically significant, the results are clinically significant, as they further indicate a trend towards fewer associated peristomal leakages for those individuals with a stoma site which was selected preoperatively.

Table 7

Mean Number of Leakages for Marked and Unmarked Stoma Sites

	Permanent	Temporary	All
Marked	n = 27 # of leakages = 36 Mean = 1.3	n = 7 # of leakages = 22 Mean = 3.1	n = 34 # of leakages = 58 Mean = 1.7
Unmarked	n = 7 # of leakages = 16 Mean = 2.3	n = 5 # of leakages = 6 Mean = 1.2	n = 12 # of leakages = 22 Mean = 1.8

The incidence of peristomal leakage varied widely. In the group of subjects who had their stoma site preselected, 19 subjects or 55.9 percent, did not experience any leakage problems. Of the 15 subjects in this group who did have leakage problems, the range of the leakage incidents for this group was 1 to 15. In the group who did not have their stoma site selected preoperatively, 6 or 50 percent, experienced leakage problems. The range of leakage incidents was 1 to 5. In Table 8, a frequency distribution of all incidents of peristomal leakage for both groups is illustrated.

Table 8

Frequency Distribution of Peristomal Leakage

Leakage Incidents	Marked	Not Marked	Overall Percentage
0	19	6	54.3
1	4	1	10.9
2	4	0	8.7
3	1	0	2.2
4	1	4	10.9
5	1	1	4.3
6	2	0	4.3
7	1	0	2.2
15	1	0	2.2

Stoma Status

A protruding stoma facilitates drainage of the effluent into an ostomy pouch. However, when a stoma is flush or retracted below the skin level, clinical experience indicates a greater potential for peristomal leakage. Statistical analysis, using a 2-way ANOVA, for the independent variables of selection of stoma site preoperatively and status of the stoma relative to the peristomal skin, with the independent variable of peristomal leakages was not possible due to the low number of subjects who had a retracted or flush stoma. In Table 9 the frequency of each type of stoma, retracted, flush, or protruding; marked or unmarked preoperatively; and the number of leakages which occurred in each group are illustrated.

Table 9

Number of Flush, Retracted and Protruding Stomas

	Retracted	Flush	Protruding
Marked	n = 2	n = 2	n = 31
Mean # of Leakages	2.5	2.5	1.3
Not Marked	n = 1	n = 2	n = 8
Mean # of Leakages	0	2.0	2.6
Total	n = 3	n = 4	n = 39

The mean number of peristomal leakages for individuals who had their stoma sites preselected and when the stoma was protruding, was 1.3. For individuals with the same type of stoma, but unmarked, the mean number of leakages was 2.6. The results of a t-test comparing the two means, t-value of -.57 and p-value of .579, indicate the difference between the two means is not statistically significant. However, when a stoma site is selected preoperatively, and is constructed so it is protruding, individuals do experience fewer incidents of peristomal leakages. This is clinically significant.

Causes of Peristomal Leakage Identified by Subjects

The majority of the subjects who experienced leakage problems identified eight reasons why peristomal leakage had occurred for them.

Change Schedule. For three subjects, each time they had a leakage problem it was because they had not changed their pouch according to the change schedule suggested for them. When they began to change their pouch on a regular schedule, they did not experience any further leakage incidents during the course of the study. Another individual had changed the pouch every three days and had not experienced any peristomal leakage. Someone suggested the pouch should be left on for a longer period of time. Thereafter, after the third day had past, this subject experienced four incidents of leakage. After returning to the original change schedule, there were no further incidents of leakage for this subject.

Factors Influencing Self-Care. Two subjects experienced extreme fatigue following the ostomy surgery. Each of these subjects had postoperative complications involving respiratory distress and/or wound infections. During the six week period following discharge from the hospital, they were tired and had difficulty in completing any activities. The management of an ostomy pouch was one more event on their list of daily activities. Fatigue, associated with the newness of the ostomy, generated anxiety and stress when management of the ostomy, emptying or changing, was required. They each stated that often they were just too tired to cope with the technicalities.

Two subjects, one who had the stoma site selected preoperatively and one who did not, developed serious wound complications following their surgery, which delayed healing and subsequently, interfered with the adherence of the ostomy pouch during the initial six week postoperative period. The wounds had a copious amount of drainage which interfered with the adherence of the pouch.

Two subjects experienced difficulties in managing the ostomy pouch.

They stated the difficulties were directly related to the pouch and not to fatigue or anxiety. One subject changed the type of pouch being used, and subsequently did not have any further difficulties. The subject who had 15 peristomal leakage incidents, also endured problems with the pouch system. Being outside the urban area, this individual did not have direct access to an ET nurse and was reluctant to contact anyone in the city. Thus, the problems persisted during the entire period of the study. When this individual was contacted by telephone call to arrange for the final interview, this subject was provided much needed information and help.

During the first three weeks at home, one subject had difficulty cutting the opening of the pouch to fit the contours of the stoma, as it was an irregular shape. As healing occurred and the stoma swelling subsided, the stoma became more rounded and no further difficulties were experienced. Another subject had difficulty seeing the stoma to properly centre the pouch. With practice, this subsided and this individual did not experience any further incidents of leakage after the first one.

Stomas Located in Skin Folds. Two individuals had the ostomy located in a skin fold. One of these subjects did not have the stoma site selected preoperatively. It is difficult to assess for skin folds and potential wrinkles when a person is lying down on the operating room table. Many skin folds are not evident until the person is sitting, bending or twisting. The second individual's abdomen was grossly distended with extensive ascites when the stoma site had been selected preoperatively. In addition, postoperatively, an extensive wound infection developed, which when healed, created a scar and crevice. This was impossible to anticipate.

Difficulties with Pouch Adherence. Two subjects experienced difficulties in the adherence of the pouch. One subject found there was too much moisture on the skin. This was related to pyrexia and when this subsided the adherence of the pouch improved. A second subject found that the additional use of *paste* improved the adherence. However, this subject had not resumed any previous activities. "I just don't trust these pouches".

Belt Lines. One subject who had the stoma site selected preoperatively, found the stoma was located very close to the belt line. Each incident of peristomal leakage was associated with bending and having a belt on. After switching to suspenders, there were no subsequent incidents of leakage.

There was a total of 81 incidents of peristomal leakage during the course of this study. Subjects were able to identify the reason associated with the leakage problem for 57 or 70.4 percent of these incidents. A summary of the problems contributing to peristomal leakage and the associated number of leakage incidents experienced by these subjects is presented in Table 10.

The majority of the reasons subjects identified as contributing to peristomal leakage, are separate issues from the criteria used for preselection of a stoma site. This emphasizes the multifaceted problem of leakage.

Peristomal Skin Condition

At the time of discharge from the hospital, 44 subjects had healthy peristomal skin. One subject had reddened peristomal skin and in another subject the integrity of the peristomal skin had been breached. Although these two subjects were discharged with an associated risk factor of peristomal leakage, neither individual experienced any leakage.

At the conclusion of the study, 5 subjects had reddened skin and in 3 subjects, the integrity of the peristomal skin had been breached. All of these subjects experienced peristomal leakages. In this group, 5 had been premarked and 3 had not. Each of these individuals attributed their skin conditions to the leakage incidents. All of these individuals were communicating with their ET nurse to try and solve the leakage problems. Four subjects using paste to enhance the adherence of the pouch, were encouraged with the results.

Table 10

Causes of Peristomal Leakage

Cause of Peristomal Leakage	Frequency	Total # of Associated Leakages
Not changing pouch regularly	4	6
Extreme fatigue	2	10
Ostomy too close to wound	2	5
Difficulty managing pouch	2	17
Ostomy in skin fold	2	3
Inappropriate application	2	4
Poor adhesion of pouch	2	10
Clothing interference	1	2
Unknown	-	24
Total	17	81

Written Instructions for Changing Pouch

Only subjects who had one or more incidents of peristomal leakage were asked if they had written instructions for changing the pouch. Of the 21 subjects who did have a leakage problems, 8 had written instructions, 9 did not, and 4 did not complete this question.

Assistance Requested When Leakage Occurred

Three subjects indicated they requested help following the initial leakage incidence. All 3 subjects changed the pouch independently, and then sought advice from the ET nurse or home care nurse. After the initial leakage, they did not request help with any further incidents. Thereafter, each of these subjects was able to successfully identify the cause of their peristomal leakage.

Preoperative and Postoperative Weight

As the weight for one subject at the time of surgery was not available, this section represents the information for 45 subjects. At the time of surgery, 20 subjects were their usual weight, 3 subjects were 4 to 7 kilograms above their usual weight and 21 subjects were 2 to 26 kilograms below their normal weight. For those who were below their normal weight, the mean difference was 8.5 kilograms. Following surgery, 18 subjects had a change in body weight, 13 subjects increased their weight an average of 4.6 kilograms.

All subjects who had a decrease in weight had cancer. The average decrease in weight for this group was 4 kilograms. Some subjects who had cancer also gained weight, The average increase in weight for those with cancer was 6.8 kilograms. Subjects did not perceive an association with weight changes and incidence of peristomal leakage.

Those subjects with inflammatory bowel disease or diverticulitis, experienced little change in weight, three increased their weight, each by 3 kilograms, and one lost 3 kilograms. The changes in weight did not appear to be associated with peristomal leakage.

Another subject who had UC and a stoma site selected preoperatively lost 3 kilograms. Although this subject experienced 7 incidents of peristomal leakage, the leakage was not perceived by the subject to be due to a change in weight, as there were no observed changes in abdominal contours. Rather, this individual had two subsequent major abdominal operations for ischemic bowel, following the initial ostomy surgery, and was very tired when discharged from hospital. This subject, under 35 years of age, had a 10 year history of smoking and a history of a cerebrovascular accident and transient ischemic attacks.

The average number of peristomal leakage incidents was 1.5 for subjects who did not have a change in body weight. For those subjects who did increase their weight, the average number of leakages was 1.9. Subjects identified other causes for peristomal leakage, not changes in body weight.

Activities of Daily Living

All subjects except one lived with a spouse or child and were returning home following discharge from the hospital. One subject remained in the city for follow-up appointments before returning home to a northern community. All subjects were going to receive help with meals, housework and grocery shopping. One subject with young children at home received help from the spouse with the care of these children.

A number of subjects were going to have home care nurses visit, one to seven times a week. Several indicated they would receive home care but at the time of the interview in the hospital, they did not know how often, even though it was just one or two days prior to their being discharged home. Only two subjects indicated the home care nurse would help with the pouch change. The remaining subjects who knew how often the home care nurse was going to visit, required help with dressing changes.

Independence with Ostomy Pouch Changes

All subjects had changed their pouches independently at least once prior to being discharged home. The number of times subjects had changed their pouches before going home ranged from 1 to 18. Seventeen subjects had changed their pouches once. The mean number of peristomal leakage incidents for this group was 1.1. Twelve subjects changed their pouches twice prior to discharge. The mean number of leakages for this group was 2.3. The mean number of leakages for the 12 subjects who changed their pouch 3 times, was 1.5. The frequency distribution and mean number of peristomal leakage incidents experienced by each group are illustrated in Table 11.

Two subjects were going to receive help with the management of their ostomy, one from a spouse and one from the home care nurse. Each of these subjects had changed their pouch independently once, prior to being discharged from the hospital.

One subject who had changed the pouch independently 8 times prior to going home, also experienced 4 episodes of peristomal leakage. This individual had surgery for a perforated diverticula and had experienced multiple complications following the surgery. When discharged from the hospital, the subject was feeling weak and tired easily.

Table 11

Independent Pouch Changes and Incidence of Peristomal Leakage

	Independent Pouch Changes Prior to Discharge					
# pouch changes	1	2	3	4	6	8 or more
# Subjects	17	12	12	4	2	4
Mean # of Leakages	1.1	2.3	1.5	1.3	1.0	0.8

It is evident that as individuals had more practice in changing their ostomy pouch prior to going home, there is progressive decrease in the number of peristomal leakages experienced.

Initial Adjustment Period

Six weeks post-discharge from the hospital all subjects completed five questions using a 5 point Likert type scale, illustrated in Table 12.

Table 12

Likert Type Scale for Recovery Satisfaction Questionnaire

1	2	3	4	5
strongly disagree		agree		strongly agree

Resumption of Previous Social Activities

The responses to the statement, *I have resumed my previous social activities outside the home*, ranged from 1 to 5, with a mean of 3.11. In Table 13 the frequency of each response and the mean number of peristomal leakages experienced by subjects according to the degree of confidence they expressed is presented. For this question, several individuals gave two responses. They indicated a 4 or 5 for the amount of confidence they felt about resuming their social activities if they just considered the ostomy, and a 1 or 2 representing how they felt overall. All of the individuals wanted it to be clear that they were reluctant to resume previous activities due to extreme fatigue. They just did not have the energy to be as active as they had been preoperatively. The mean of 3.11 was derived using the lowest number indicated. There was a negative relationship between the responses to this statement (using the lowest number given) and the number of peristomal leakages. The computed correlation was -.28.

Table 13

Resumption of Previous Social Activities Outside the Home

	Responses On 5 Point Likert Scale				
Point on Likert Type Scale	1	2	3	4	5
Frequency of Responses	8	11	11	6	10
Mean # of Peristomal Leakages	4.5	1.0	1.1	1.8	1.0

Confidence in Changing Pouch

The responses to the statement, *I feel confident when I am changing my pouch*, ranged from 1 to 5, with over two thirds of the respondents indicating they were confident. In Table 14 the frequency of each response and the mean number of peristomal leakages experienced by subjects according to the degree of confidence they expressed is presented. There was a slightly negative correlation, -.09, when the answers were examined in relationship to the number of peristomal leakages.

Table 14

Personal Confidence in Changing Ostomy Pouch

Responses On 5 Point Likert Scale					
Point on Likert Type Scale	1	2	3	4	5
Frequency of Responses	1	2	8	11	24
Mean # of Peristomal Leakages	2.0	1.0	2.7	1.9	1.4

Confidence in Resuming Former Activities

The responses to the statement, *I feel confident about resuming my former activities*, ranged from 1 to 5. There was a negative relationship, -.23, when the responses were compared with the number of peristomal leakages. In Table 15 the frequency of each response and the mean number of peristomal leakages experienced by subjects according to the degree of confidence they expressed is presented.

Table 15

Personal Confidence in Resuming Former Activities

Responses On 5 Point Likert Scale					
Point on Likert Type Scale	1	2	3	4	5
Frequency of Responses	4	13	10	9	10
Mean # of Peristomal Leakages	6.3	1.5	0.4	1.9	1.8

Family Support

The responses to the statement, *my family has given me support*, ranged from 3 to 5. In Table 16 the frequency of each response and the mean number of peristomal leakages experienced by subjects according to the degree of confidence they expressed is presented. The computed correlation with both variables was -.07.

Table 16

Family Support

Responses On 5 Point Likert Scale					
Point on Likert Type Scale	1	2	3	4	5
Frequency of Responses	0	0	1	2	43
Mean # of Peristomal Leakages	---	---	3.0	2.0	1.7

Support From Friends

The responses to the statement, *my friends have given me support*, ranged from 3 to 5. In Table 17 the frequency of each response and the mean number of peristomal leakages experienced by subjects according to the degree of confidence they expressed is presented. The computed correlation between the two variables was .09.

On the whole, subjects tended to have high scores, on this questionnaire, except for question one. In that case, when the score was low, there was also a second score given. Participants spoke of feeling positive about their future activities and looked forward to resuming many of the things they did before. The majority did not feel the ostomy was going to be a problem. The few individuals who did have some negative feelings about the ostomy, indicated it was because of the peristomal leakage problems they were experiencing.

All individuals valued the support of friends and family. There was minimal variation in the responses to these two questions.

Table 17

Support From Friends

Responses On 5 Point Likert Scale					
Point on Likert Type Scale	1	2	3	4	5
Frequency of Responses	0	0	1	6	39
Mean # of Peristomal Leakages	---	---	0.0	1.5	1.9

Summary

The number of peristomal leakages tended to be fewer for those individuals who had a stoma site marked preoperatively, and when the stoma was permanent and protruding. Although the results of the t-tests were not statistically significant at an alpha level of .05, this does not necessarily mean that the null hypothesis is accepted, especially when the sample size was so small. The results have clinical significance. It would be of value to test the hypothesis with a larger sample size. Individuals with more practice changing the pouch in the hospital tended to have fewer incidents of leakages when they went home.

Several individuals who had wound complications or other health problems, did go home feeling tired and without the energy to resume their former activities, even at the end of six weeks at home. All individuals when discharged, initially stayed with someone, and received help with housework, meal preparation, and grocery shopping. Home care was arranged for a few individuals. All participants in the study, valued the support of friends and family.

During the course of this study, several individuals did have peristomal leakage problems. Many of these individuals were able to problem-solve, and found solutions for their leakage problem. However, a few individuals who continued to have incidents of leakage, did not identify a solution nor did they call anyone or seek help. The important question is, why not? It is possible that the postoperative period for them may have been emotionally overwhelming and it was thus, not the best time to absorb new information and develop new skills for self-care. Another possibility is a lack of knowledge about available resources. Were they reluctant to call anyone? If so, why? Did they know who to call? There is the possibility that they felt a sense of shame, due to the lack of bowel control, as a result of the peristomal leakage. All of these questions need to be addressed.

CHAPTER FIVE

Discussion

Today, ostomy surgery is associated with a variety of surgical procedures. The creation of an ostomy for the elimination of bowel effluent on a permanent or temporary basis, continues to be a viable option for individuals with cancer, ulcerative colitis, Crohn's disease, perforated diverticula, and life threatening abdominal infections. This is evidenced by the range of diseases, gender, ages and marital status represented by the individuals in the sample for this study. The issue of what factors influence peristomal leakage and how to prevent the incidence of leakage is a multifaceted problem. Several issues were identified in this study, but it is evident that only the tip of the iceberg has been explored.

Preoperative Stoma Site Selection

It was apparent from clinical nursing experience, and the results of this study, that individuals who have their stoma sites assessed and selected preoperatively, experience fewer incidents of peristomal leakage. The choice of having a preferred stoma site assessed preoperatively is the physician's or it may be related to the nature of the surgery, whether it is elective or emergency.

The selection of a preferred stoma site preoperatively is not always possible. When emergency ostomy surgery is performed as in this study, for subjects with bowel perforations, there is little time to select a stoma site preoperatively, due to the urgency of the health problem. A precise stoma site assessment is difficult due to the rigidity and swelling of the abdomen from peritonitis. These patients are acutely ill and often, are unable to physically participate in the assessment of a stoma site.

Stoma Sites and Peristomal Leakage

In assessing an individual for the selection of a preferred stoma site, many factors are considered. Clinical nursing experience supports the value of the criteria used in this study. Although subjects in this study who had a stoma site selected preoperatively using a specified set of criteria, did have one or more incidents of peristomal leakage, the mean number of leakages, while not statistically significant, was lower then the mean number of leakages for those individuals who did not have their stoma site selected preoperatively.

In some situations, one may wonder if all criteria were considered when the stoma site was selected. In this study, one individual experienced leakage problems related to interference from a belt. Another individual had difficulty seeing the stoma, to properly centre the pouch. For many individuals who have peristomal leakage problems, one can identify one or more of the criteria which may not have been considered when the stoma was sited. The criteria are a guide. Whenever possible, it is hoped that all criteria can be met. However, there are occasions when it is not always possible to fulfil all criteria, and a compromise is needed.

Creases or folds in the peristomal skin area contribute to leakage incidents. This was the case for one subject in this study. Following surgery, and in the absence of ascites which had been present preoperatively, it was apparent that the stoma had unintentionally been located in a skin fold. Some subjects in this study had leakage problems which related to their scars, drainage and infections from the abdominal wounds. One cannot always anticipate these problems. However, it is prudent to consider the location of the incision when choosing a stoma site. If there is any doubt it is important to clarify the proposed surgery with the physician. If there are few alternatives for a stoma site, informing the physician is of value. It is easier to move an incision than to cope with life-long peristomal leakage problems.

Construction of the Stoma

It has long been recognized that there are fewer incidents of peristomal leakage when the stoma protrudes slightly above skin level (Brooke & Walker, 1962; Doberneck, 1991; Light, 1992; Silvers, 1940). When an ostomy has a slight spout, the effluent is more easily emptied directly into the pouch. When a stoma is flush with the skin or retracted below the skin surface, the effluent may seep under the skin barrier of the pouch causing peristomal leakage. In this study, there were only a few individuals who had a flush or retracted stoma.

Individuals with a long history of IBD, often are underweight significantly, when they have ostomy surgery. This needs to be considered, because if they gain a significant amount of weight following surgery, a protruding ostomy may become a retracted one, due to the increase in the abdominal wall thickness. Thus, it is important when assessing a stoma site preoperatively, to ask patients what is their usual weight. In this study, changes in body weight did not appear to influence peristomal leakage or alter the stoma status relative to the skin.

Participants in this study who did have a protruding stoma and who were marked preoperatively, did have fewer incidents of peristomal leakage than those who were not marked. The difference in the mean number of leakages, while not statistically significant, is clinically important for these individuals.

Permanent versus Temporary Ostomy

The mean number of peristomal leakages for individuals who had a permanent ostomy was lower than those who had a temporary ostomy. It may be that individuals give less attention to problems related to leakage when it is only for a short period of time. They may be focusing on recovery, in order to have the second operation as soon as possible. When something is only temporary, it has less meaning in a person's life than when it is permanent. When a stoma is permanent, there are long-term implications, and for these individuals, solving the problem of leakage is important for the future. When the stoma is temporary, the focus for these individuals is closure of the ostomy.

Self-Care of the Ostomy

Self-care of an ostomy is a significant factor. Managing elimination is an intimate personal event. To preserve personal privacy, it is important that individuals are able to manage this aspect of daily care. In this study the trend was towards a negative relationship between the number of times a person had independently changed the pouch and the number of peristomal leakages. For individuals who changed their pouch independently more than once prior to going home, there was a trend towards fewer incidents of leakage as the amount of practice increased.

Many individuals in this study were able to successfully solve their own leakage problems. This has implications for nursing practice. We need to ensure that individuals are given enough information to develop an understanding of the management of an ostomy, care of the peristomal skin and the necessary equipment.

Two subjects who did have peristomal leakage problems, expressed having difficulties in managing the ostomy pouch. The specifics about the difficulties were not given. Perhaps, a change in the type of pouch being used would be helpful. One individual initially had difficulty in applying the pouch due to visual restrictions. Several individuals indicated a history of rheumatoid arthritis. Potential ability for self-care needs to be carefully considered when selecting a stoma site.

The physical well-being of an individual influences how well they can manage the care of an ostomy. Several individuals in this study experienced difficulty with self-care due to fatigue and limited stamina. All of these subjects had experienced severe postoperative complications which required extended hospitalization. Only two individuals were going to receive help with changing their ostomy pouch. Everyone else in the sample indicated they would be doing this activity independently. A detailed assessment for self-care needs and ability prior to discharge from hospital is important (Pritchard & Greer, 1989).

At the time of the initial hospital interview, a few subjects indicated they would be receiving home care but were unsure how often the nurse would be coming. They were also unsure as to what this nurse would be doing for them. This lack of knowledge must cause further uncertainty and distress for individuals. When we are teaching individuals self-care skills and how to plan for the future, we need to ensure that we are facilitating their planning with accurate and relevant information and knowledge, individualized to meet their needs (Pritchard & Greer, 1989).

Patient Education Programs

Subjects' ability to problem-solve was not explored in this study. It is apparent that several individuals were able to identify the cause of their peristomal leakage and rectify the difficulty, but several were not. The value of knowledge in patient teaching programs for patients who have ostomy surgery is universally recognized. However, the inclusion of coping styles and problem-solving skills have not been explored in this patient population. In reviewing the literature about patient education programs, it became evident these issues have been explored in other education programs.

Problem-solving skills are recognized as essential for health professionals in clinical practice (Aadalen & Mathews, 1989; Field, 1992; Holbert & Abraham, 1988; Jacobs & Lyons, 1992; Nehring, Durham, & Macek, 1986; Scheetz, 1989; Slaughter, Brown, Gardner, & Perritt, 1989). If they are of value for health professionals, surely they must have a positive contribution for patients' abilities to do self-care.

On examining the perceived need for information by patients with an acute medical or surgical illness, Bubela, et al. (1990) found a positive correlation with the influence of an illness on patients' lifestyle. Patients' perception of the value and importance of education programs, prior to discharge from hospital, changes after being at home and coping with the everyday reality (Chan, 1990). Several subjects in this study were able to change their pouches independently prior to discharge, but still experienced leakage when at home. While the problem of leakage may be due to increased physical activity, the ability and opportunity to problem-solve several potential causes of leakage may not have been available while in hospital.

Patients who use problem-focused coping rather than emotion-focused coping methods have a more positive psychosocial adjustment to their changes in body image and physical functioning (Keckeisen & Nyamathi, 1990). When patients had a *repressive* coping style, learning was limited (Murphy, Fishman, & Shaw, 1989). According to Janelli, Scherer, & Schmieder (1991), there is a need to include coping strategies in patient education programs. Problem-solving skills contribute to self-efficacy and improve personal management of health care needs (Glasgow et al., 1992; Gonzalez, Goeppinger, & Lorig, 1990). Facilitating the initiation of a positive adjustment with effective coping and problem-solving skills would be of value for many patients who go home with a new ostomy.

The presentation and content of patient education programs for individuals who have an ostomy, needs to be examined. There is wide variation in patients' reading abilities. Belton (1991) found that many patients read at a below average level. Thus, all printed information in patient education programs needs to be carefully evaluated. Many subjects in this study went home with written instructions for changing their ostomy pouch. Although data about whether they used these instructions was not collected in this study, the usefulness of these instructions needs to be investigated.

According to Pichert (1990), appropriately designed programs are not successful without effective teachers. Staff development programs for patient teaching are essential. Today, the environment of acute care hospitals is not always conducive to patient teaching and learning. Before patient teaching begins, a quiet uninterrupted area needs to be secured.

There were subjects in this study who experienced peristomal leakage problems and did not seek help. The important question is, why?

Health Care Resources

The setting for this study was two large urban centres, each of which has a home care program. In one city there are two community ET nurses, who also have clinics in the rural areas. In the other city, there is no community ET nurse. Data about visits from the community ET nurse was not collected in this study.

A valuable resource for patients with a new ostomy is the United Ostomy Association (UOA). A trained ostomy visitor from this organization can provide the personal perspective of having an ostomy. Not all subjects in this study had an ostomy visitor. Subjects were only asked if they had a visit from a member of the UOA. The reasons why they did or did not, were not explored.

All of the subjects indicated they had received support from family and friends. Everyone was going to receive help with meals, grocery shopping and housework. The majority of subjects did not have the responsibility of caring for other family members. Although it would seem that all subjects had some means of support, few of them accessed help with peristomal leakage problems. This is significant.

In this study, subjects were only asked if they sought assistance when they had an episode of leakage, and if they did, who did they call. The reasons why people did not seek help were not explored. However, this is apparently an important issue. Some individuals had more than three episodes of leakage, and still did not seek help. A number of questions arise. Were these people unaware of resources available? Were they reluctant to seek help? Were they ashamed of not having bowel control? Did they feel socially stigmatized by having an ostomy? If the answer is yes to any of these questions, the reasons why they felt this way needs to be explored. Solutions need to be found to eliminate this dilemma.

It is clear that the incidence of peristomal leakage is frustrating and negatively affects confidence in resuming preoperative activities. Thus, there is a need to explore the reasons why people do not access the resources available. Creating a solution for preventing leakage is challenging, but is often very successful. There may be a period of trial and error with new skin barriers, pastes and/or pouches, but with clinical expertise and patience the problem can be solved. Perhaps, this point needs to be reinforced during patient/family teaching prior to discharge.

Following ostomy surgery, a patient needs time to recover from major surgery, come to terms with a new diagnosis if the surgery was for cancer or diverticulitis, and with the personal reality of a stoma, as well as learn how to manage the care of the stoma, empty and apply a new pouch. It takes practice and time to learn these new skills. Several subjects in this study did not seek help and did experience peristomal leakages. Patient education programs which include a follow-up telephone call or personal visit have been of value in meeting the learning needs of patients following discharge from hospital (Gortner & Jenkins, 1990; Graff, Thomas, Hollingsworth, Cohen, & Rubin, 1992; Pasquarello, 1990). A follow-up telephone call may have been of value for those individuals who did not seek help with their leakage problems.

Enterostomal Therapy Nursing

Many years ago, for patients having ostomy surgery, early intervention and proper equipment was not available (Rolstad, 1987). With the introduction of enterostomal therapists (Turnbull, 1961), and support of surgeons (Gazzard, Saunders, & Dawson, 1978), this patient population had a more positive adjustment (Lenneberg, 1971, 1974; Loeb, 1971; Schuster, 1972; Turnbull, 1961). According to Kranzman (1990), "ET nurses' role improves the quality of patient care to a select group of patients" (p.222). Rolstad (1987) believes ET nurses "facilitate psychosocial adaptation and resumption of previous lifestyle" (p.28). The intervention of an ET nurse has a positive impact on the personal adjustment process which follows ostomy surgery (Hedrick, 1987).

The nursing practice of selecting a preferred stoma site using specified criteria evolved with the practice of enterostomal therapy nursing and is a part of all enterostomal therapy nursing education programs. Today, although not universally accepted by all physicians, it is a part of the clinical practice of all ET nurses and many surgical nurses who practice in tertiary care hospitals, when they are consulted by the attending surgeon. In smaller communities where there is only one ET nurse who is based in the community, often patients who have ostomy surgery are not seen preoperatively by the ET nurse. Several of these ET nurses indicated an interest in having this study implemented in their communities as they encounter many problems with peristomal leakage. For many community based ET nurses, it was the rare patient who had a stoma site selected preoperatively (personal communication, 1988 to 1989).

It is very frustrating as an ET nurse to see some patients have few problems with adjustment and the management of their ostomy, while others experience major problems related to an inability to have a secure pouch system resulting in frequent incidents of leakage. For many of these individuals, a personal assessment for a preferred stoma site had not been performed preoperatively. It is evident from conversations with these individuals, that they are not participating in many of the activities they had been involved with before the ostomy surgery. Some individuals have become social recluses following their ostomy surgery. All individuals attributed their reluctance to participate in social functions, to peristomal leakage problems or the fear of a leakage.

Implications for Nursing Practice

Selection of a preferred stoma site preoperatively for all patients when ostomy surgery is anticipated, is a proactive nursing practice and an essential aspect of health promotion. It is evident that the problems associated with peristomal leakage are significant and multifaceted.

A person's ability to perform self-care activities related to all aspects of ostomy management needs to be carefully assessed. It is essential that patient/family teaching is individualized to meet the unique needs of individual patients and families. It is important that patients know how to problem-solve when there is an episode of peristomal leakage. This is a much needed area for study in this patient population.

Problem-solving does not necessarily need to be done independently all of the time. Patients need to be encouraged to seek out information and to telephone designated individuals when they are having a problem. Perhaps a follow-up telephone program for all patients within three weeks of their being discharged needs to initiated. The findings in this study indicate that this would provide individuals with a much needed resource.

The findings from this study while not statistically significant, do indicate the importance of preoperative stoma site selection using a specified set of criteria, for all patients where ostomy surgery is planned or anticipated. Individuals in this study who had their stoma site selected preoperatively and when the stoma was protruding, experienced few incidents of peristomal leakage.

Limitations of the Study

This study evolved from clinical nursing practice. It was intended to explore the issue of peristomal leakage by examining the relationship of preoperative stoma site selection with the incidence of leakage, and the impact leakage has on initial personal adjustment of having an ostomy.

A major limitation in this study is the small sample size. Access to potential subjects was limited due to costs and attempts to control for individual learning by subjects. As an initial study, it was important to have a uniform setting. Therefore, only tertiary care hospitals with an established Enterostomal Therapy Nursing Department and ET nurses with several years of clinical experience, were approached to participate in the study. Access to subjects was also limited due to several other research studies being conducted and accessing the same patient population.

A second major limitation in this study is related to the limited scope of the study. The findings confirm the multifactorial nature of peristomal leakage and all of the issues or problems within the confines of this clinical study cannot be explained.

A third major limitation relates to the questionnaires used in this study. It is evident from the responses that some issues were not explored sufficiently. From initial questions more questions have developed.

Future Nursing Research for this Population

This was an initial clinical nursing research study about a challenging area of nursing practice. The findings do highlight clearly that future investigation into each extraneous variable affecting peristomal leakage is important. Replication of this study in another setting would be of value. In the Likert scale used in this study, the middle of the scale was labelled, *agree*. In a second study, this would be eliminated, to gain a more personal perspective from the subjects.

In a replication study with a larger sample size, it would be of value to explore several issues in more depth. In this study a simple question was asked about whether or not a subject had written instructions about changing the ostomy pouch. Additional questions which need to be asked are: Do you understand the instructions? Did you use the instructions? Were the instructions helpful? If so, in what way? If not, what would have been helpful for you?

The development of multiple self-help groups for various health problems demonstrates that these organizations are of value for many individuals. In this study, individuals were asked if they had an ostomy visitor? It would be of value to know, why they did not have a visitor? Was the opportunity to have a visitor offered? If they did have a visitor, did they contact that person once they were home? If so, was it of value and in what way? If not, why not? My experience has been that many patients decline to have an ostomy visitor while in the hospital, but once they are home and feeling better, they would like to have one. Thus, if there was a telephone follow-up program this could be arranged. An ostomy visitor is a valuable resource for individuals who have had ostomy surgery. The visitor can give a personal perspective, always a valuable model.

The relationship between peristomal leakage and adjustment is not clearly understood, but it would seem that there is a negative relationship. Ostomy surgery is unique and has an impact on a very fundamental aspect of personal privacy. Societal attitudes about elimination inhibit open discussion of concerns (Rolstad, 1987). We need to have an indepth understanding about the process of how individuals come to terms with the reality of an ostomy, in order to provide the needed support and counselling to this population. A study using a grounded theory approach would be of value to increase our knowledge about the adjustment process of having an ostomy.

Patient education programs for individuals who have ostomy surgery need to be compared and evaluated. The necessity of problem-solving skills and how to develop these skills, needs to be determined.

A few subjects in this study did not follow the suggested change schedule for their ostomy pouches and another individual was told to leave the pouch on longer. All of these subjects experienced leakage problems due to not changing the pouch as originally scheduled. The length of time a pouch remains in place needs to be clarified. There are a variety of skin barriers, each with a different lifespan. Plus, the lifespan of skin barriers varies with the climate, an individual's activity, and how the pouches are stored.

Some individuals may be encouraged to leave an ostomy pouch on for a longer period of time due to the expense of the pouches. However, while this may directly save in health care dollars, when peristomal leakage is occurring unexpectedly there is a potential social cost. A few subjects in this study who were experiencing leakage, did not feel confident about leaving home. Without a solution to the leakage problem, they may become social recluses. The subsequent social cost has a much more significant long range implications than the direct health care dollars for a pouch. There is need to explore the social implications of having an ostomy and concerns about peristomal leakage.

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Appendix A

Pilot Study 1: Survey of Criteria Used by ET Nurses

I am interested in developing a standard criteria for the selection of a stoma site preoperatively when ostomy surgery is anticipated. This standard is to be used as a guide in a research project. The purpose of the research project is to examine the incidents of peristomal leakage in relation to stomas which were marked preoperatively and those which were not.

As a practicing ET nurse, your input is of value. Please review the following list of criteria for selecting a stoma site preoperatively and answer the questions on the following page.

Thank you for participating. Your name and comments will remain confidential. If you would like a summary of the final results of this project, please complete the last page of this package.

Criteria for Stoma Site Marking

1. Area is free of wrinkles, dimples, folds, creases, and scars.
2. Umbilical area is avoided.
3. Bony prominences, such as iliac crests, pubis, and costal margins, are avoided.
4. Stoma is located opposite the rectus muscle.
5. Patient can see the proposed stoma site.
6. Patient can reach the proposed stoma site.
7. Patient's lifestyle will not interfere with the proposed stoma site (such as wheelchair or prosthetic device as well as occupation).
8. Patient's belt line will not interfere with pouch drainage or adherence.
9. Patient's clothing will not interfere with pouch.
10. Ensure these criteria are satisfied when patient is standing, sitting, and bending.

Questionnaire

1. Do you use all of these criteria when selecting a stoma site?

YES ____ NO ___

If no, which criteria do you not use? Indicate which number.

____

Why do you not use these criteria?

____

____

____

____

2. Do you use additional criteria? YES ___ NO ___

If yes, what other criteria do you use?

____

____

____

____

Why is it important to use these criteria?

____

____

____

____

3. What method do you use to indicate the selected stoma site?

____

4. Please use the reverse side of this form for your comments and suggestions.

Would you like a summary of the results of this study?

YES ____ NO ____

If yes, please complete the address information and return with the questionnaire in the enclosed envelope.

NAME ____

ADDRESS ____

____

____

____

Appendix B

Criteria for Stoma Site Selection

Criteria for Selecting a Stoma Site

1. Area is free of wrinkles, dimples, folds, creases, and scars.
2. Umbilical area is avoided.
3. Bony prominences, such as iliac crest, pubis, and costal margins are avoided.
4. Stoma is located within the margins of the rectus muscle.
5. Patient can see the proposed stoma site.
6. Patient can reach the proposed stoma site.
7. Patient's lifestyle, such as wheelchair, prosthetic device, or occupation will not interfere with the proposed stoma site.
8. Patient's belt line will not interfere with the pouch drainage or adherence.
9. Patient's clothing will not interfere with the pouch.
10. Ensure these criteria are satisfied when the patient is standing, sitting, bending, and twisting.

Appendix C

Letter to Physicians

3535 - 106 A Street
Edmonton, Alberta
T6J 1A7

DATE

Dr.
Address
City, Province
Postal Code

Dear Dr. :

I am a nursing student who is taking a Master's degree in nursing at the University of Alberta and at the present time, am working on my thesis. I am interested in the peristomal leakage problems which individuals who have had ostomy surgery experience. To complete this study, I am requesting written approval from you to access subjects from the *-name of institution-* during the next few months.

It is understood that potential subjects will voluntarily participate in the study. They may decide to withdraw from the study at any time without loss of benefits to them. All personal information will be kept strictly confidential. Final results of the study will be presented without reference to any individual subject or institution.

I am enclosing a copy of the thesis proposal for your perusal. If you have any questions, please contact me or my thesis supervisor.

I am attaching a form for you to sign and return to me in the stamped self-addressed envelope should you approve the participation of your patients in this study. I would appreciate hearing from you at your earliest convenience.

Yours sincerely,

Sue Russell, RN., ET.
Master of Nursing Candidate
Faculty of Nursing
University of Alberta
Phone: 434-4914

Marion Allen, PhD., RN.
Thesis Supervisor
Professor
Faculty of Nursing
University of Alberta
Phone: 492-6411

Appendix D

Permission Form from Physicians

For Sue Russell

I, Dr. **, support Sue Russell and her research assistant, **name of research assistant for that hospital**, in association with **name of Enterostomal Therapy nurse in that hospital**, in the study titled, **Preoperative Stoma Site Selection and Peristomal Leakage Problems**. I give my approval for accessing subjects who are under my care at the *-name of the institution*. It is my understanding that should medical problems occur during the course of this study, I will be informed.

____

signature

____

date

Appendix E

Information Letter for Potential Participants

Address

Date

Dear Interested Participant:

I am an enterostomal therapist who is taking a Master's degree in Nursing at the University of Alberta. For several years I have worked as an ostomy nurse. This experience stimulated my interest in the problems which occur when people have ostomy surgery.

I am investigating the leakage problems which may occur when people have ostomy surgery. several factors have been linked with leakage problems. These are the site of the stoma, the change schedule for the ostomy pouch, age, weight, and type of ostomy. I would also like to look into the difficulties people may have with their daily activities when there are leakage problems.

It is hoped that the results of this study will be useful in the future to help other patients who have ostomy surgery.

If you agree to participate in this research project, you will be asked to complete 3 questionnaires over a 7 week period of time. All information will be confidential. Your name will not appear on any of the forms. Your identity will be known only to me. I will be the only one who will see the completed questionnaires.

There is no risk to you if you decide to participate in the study. The care you receive will not be affected in any way should you agree or not agree to participate.

You will be free to withdraw from the study at any time.

If you are interested in being part of the this study or would like more information, please complete the attached form and place it in the enclosed envelope. Seal the envelope and return it to your nurse or enterostomal therapist. She or he will forward it to me. I will then visit you in the hospital.

Thank you for your interest. I look forward to hearing from you.

Yours sincerely,

Sue Russell, R.N., E.T.
Master of Nursing Candidate

Appendix F

Consent Form

INFORMED CONSENT

Title of Research - Preoperative Stoma Site Selection and
Peristomal Leakage Problems

Researcher	Advisor
Sue Russell	Dr. Marion Allen
Master of Nursing Candidate	Professor
Faculty of Nursing	Faculty of Nursing
University of Alberta	University of Alberta
Telephone: 434-4914	Telephone: 492-6411

Purpose of the Study

The purpose of this study is to look at the choice of stoma sites, leakage problems people may have and how these problems affect a person's daily activities.

Procedure

While in hospital you will complete an information questionnaire. It will take about 5 minutes to complete this form. The researcher will look at your hospital record to complete a second information form. These forms will have information about you and your surgery. This includes such things as age, sex, marital status, date of surgery, reason for your surgery, operation, type of ostomy, and plans for care at home when you leave the hospital.

Before you leave the hospital, you will be given an information package with several forms. One of the forms, is to be filled out each time you have a leakage around your stoma. This is to be done for 6 weeks after you leave the hospital. It will take about 15 minutes to fill out this form. This form has questions about your activities when the leakage happened, when you change your pouch, the type of pouch, and any problems you are having with the pouch. You can get extra forms from the researcher.

After 6 weeks, the researcher will visit you at home. During the visit you will fill out a form. This form has questions about how confident you feel when changing your pouch and returning to your activities. You will also be asked about the support you received from family and friends. This questionnaire will take about 5 minutes to complete.

During the home visit the researcher will look at your stoma and the skin around the stoma.

Risks

Taking part in the study may not help you directly. However, the information from this study may help future patients. It is hoped that any new knowledge from the study may help nurses and health professionals care for other patients having ostomy surgery.

(over)

Voluntary Participation and Confidentiality

You do not have to be in this study if you do not want to be. If you do decide to take part in the study, you are free to withdraw at any time. Taking part in the study or withdrawing from the study will not affect the care you receive. If you want to drop out of the study, let the researcher know. If you do not want to, you do not have to answer any of the questions on the questionnaires, nor change your pouch at the time of the home visit.

Your name will not appear on any of the forms. You will only be identified by a number. Only the researcher will know your number. All information, including your name, address, and phone number will be kept in a locked cabinet. At the end of the study, your name, address, and phone number will be destroyed. The completed questionnaires will be kept for 5 years, and will then be destroyed. Your name will not be included in any reports of this study, nor in any articles or talks about the study.

If you have any questions or concerns at any time, you are free to call the researcher, Sue Russell, or advisor, Dr. Marion Allen.

Consent

I, ____, have read this information, and agree to be in the study called, 'Preoperative Stoma Site Selection and Peristomal Leakage Problems'. I have had the opportunity to ask questions about the study and my part in it. The researcher, Sue Russell, has answered all my questions at this time. I am aware that during this study, should the researcher become aware of information which may be harmful to my health, she will discuss this with me, prior to seeking help on my behalf. I have been given a copy of this consent form.

____ ______________
signature of participant date

____ ______________
signature of researcher date

____ ______________
signature of witness date

I also give permission for the researcher to contact me in the future to be part of another study. YES _____ NO _____

____
signature of participant

____

____
address

Appendix G

Second Information Letter

3535 - 106 A Street,
Edmonton, Alberta,
T6J 1A7.

Dear Participant:

Thank you for participating in this study about the problems people who have ostomy surgery may experience.

Several factors have been linked with leakage problems. In this study I will look at these factors and others. I will also look into the difficulties people may have with their daily activities when there are leakage problems.

It is hoped that the results of this study will be useful in the future to help other patients who have ostomy surgery.

Your participation in this study will be for the time you are in the hospital and for the 6 weeks after you leave the hospital. The first form you fill out will be biographical questions about yourself, and reasons for the surgery. Please see the enclosed light blue form. There is a second part to this questionnaire. It is a darker blue. I will complete this form when I have the information from your hospital chart.

When you leave the hospital you will be asked to complete a Peristomal Leakage Form, the enclosed pink form. This form needs to be completed each time you have a leakage around your stoma. There are 6 of these forms enclosed in this package. You may obtain more of these forms by contacting *name of researcher or research assistant* at *appropriate telephone number*.

At the end of 6 weeks *name of researcher or research assistant* will visit you at home or contact you by telephone. At that time, you will be asked to complete a third form. It is the Recovery Satisfaction Form, and is the green form included here. ** would also like to know about your stoma and skin around the stoma.

There is no risk to you by participating in the study. You are free to withdraw from the study at any time. The care you receive will not be affected in any way should you decide to withdraw. The questionnaires will be anonymous. Your name will not appear on any of the forms. Your identity will be known only to me. I will also be the only one who will see the completed questionnaires.

I know that the study will involve time and effort. If you have any questions or concerns about the study, please call the researcher or research assistant, **, at ** or write to me or my advisor, Dr. Marion Allen, at the University of Alberta, Faculty of Nursing, Edmonton, Alberta, T6G 2G3.

Thank you for participating in this study.

Yours sincerely,

Sue Russell, R.N., E.T.
Master of Nursing Candidate

Appendix H

Biographical Information Questionnaire: Part A

Code #

Biographical Information Questionnaire: Part A

Please answer the following questions. When you are finished answering the questionnaire, please put it in the attached envelope, seal it, and put it in your bedside table.

All information will be kept confidential.

1. Today's date ______________________________

2. How old are you? ______________________________

3. Are you MALE or FEMALE? ______________________________

4. Are you SINGLE, MARRIED, SEPARATED, DIVORCED or WIDOWED? ________

5. What day did you have your operation? ______________________________

6. What was the reason for your operation? ______________________________

____

7. Do you have an ILEOSTOMY or a COLOSTOMY? ______________________________

8. How much did you weigh when you had this operation? ______________________________

9. How much do you usually weigh? ______________________________

10. Do you live by yourself? YES ______ NO ______

If NO, with whom do you live at home? ______________________________

____

11. Will you be going home when you are discharged from the hospital? YES ______ NO ______

If NO, where will you going to stay? ______________________________

____

12. Will there be someone to help you when you are discharged?

YES ___ NO ___ If YES, indicate YES or NO for the following activities.

Housework _____ Meals _____ Grocery shopping _____

Changing the ostomy pouch _____

Care of other family members _____

13. Will you be receiving home care? YES ______ NO _____

If YES, how often? ______________________________

14. Did you have a visitor from the United Ostomy Association while you were in the hospital? YES _____ NO _____

Appendix I

Biographical Information Questionnaire: Part B

Code #

Biographical Information Questionnaire: Part B

The information needed to complete this form will be obtained from the subjects' hospital records and through discussion with each subject.

All information will be kept confidential.

1. Date ______________________________
2. Surgeon ______________________________
3. Reason for surgery ______________________________
4. Surgical procedure ______________________________
5. What anatomical area of the bowel was used to construct the stoma? ______
6. Was the surgery elective or emergency? ______________________________
7. Associated complications ______________________________

   ____
8. Associated medical conditions ______________________________

   ____
9. Is the ostomy temporary or permanent? ______________________________
10. Status of stoma and peristomal skin within 2 - 3 days prior to discharge from hospital ______________________________

    ____
11. Is stoma retracted, flush, or protruding in relation to skin level? _________
12. What type of ostomy pouch will subject be using at home?

    ____

    ____

    ____
13. How often has the subject changed his/her ostomy pouch prior to discharge?

    ____

Appendix J

Peristomal Leakage Form

Code #

Peristomal Leakage Form

Please complete this form each time your pouch leaks.
At the end of the 6 weeks, the investigator will pick up all the forms you have used.
All information will be kept confidential.

1. Date ____

2. What time of day was it when the leakage occurred?

____

3. What were you doing when the leakage occurred?

____

____

____

4. How long had it been since your ostomy pouch was changed?

____

5. Do you change your pouch according to a regular schedule?

YES _____ NO _____

How often have you been changing your pouch? ____________________

____

6. Do you have any skin problems around the stoma?

YES _____ NO _____

If YES, please describe the skin condition. ____________________

____

____

7. Do you have any problems when you change your ostomy pouch?

YES _____ NO _____

If YES, please describe the problems you have. ____________________

____

____

____

(OVER)

8. What type of ostomy pouch are you using ? Take the name from the box. ______________________________

____

9. Is this the same type of ostomy pouch you were using when you last changed your pouch? YES _____ NO _____

If NO, what was the reason you changed? ______________________________

____

____

____

10. Is the pouch comfortable when you move about?

YES _____ NO _____

If NO, what is it about the pouch that makes it uncomfortable?

____

____

____

11. Are you experiencing any difficulties in using this pouch?

YES _____ NO _____

If YES, please describe the difficulties you have with this pouch.

____

____

____

____

12. Do you have written instructions for changing your pouch?

YES _____ NO _____

13. Did you call or ask anyone for help when this leakage occurred?

YES _____ NO _____

If YES, whom did you call or ask? ______________________________

____

____

Appendix K

Recovery Satisfaction Questionnaire

Code #

Recovery Satisfaction Questionnaire

For the following questions, please circle the number which you feel best describes you. A number 1 would indicate you strongly disagree with the statement, a number 3 would indicate you agree, and a number 5 would indicate that you strongly agree.

1. I have resumed my previous social activities outside the home.

1..........2..........3..........4..........5
strongly agree strongly
disagree agree

2. I feel confident when I am changing my pouch.

1..........2..........3..........4..........5
strongly agree strongly
disagree agree

3. I feel confident about resuming my former activities.

1..........2..........3..........4..........5
strongly agree strongly
disagree agree

4. My family has given me support.

1..........2..........3..........4..........5
strongly agree strongly
disagree agree

5. My friends have given me support.

1..........2..........3..........4..........5
strongly agree strongly
disagree agree

Appendix L

Pilot Study 2: Data Collection Instruments

After you have completed the enclosed questionnaires, please complete the following questionnaire. There is a section for each form. When you have completed all forms, please return them to me in the enclosed self-addressed stamped envelope enclosed.

BIOGRAPHICAL INFORMATION FORM

1. How long did it take you to complete the Biographical Information Form?

____ minutes.

2. Was this questionnaire difficult to understand? YES ____ NO ____

If yes, please describe what was difficult for you to understand.

____

____

3. Do you think there are any other questions I need to ask?

YES ____ NO _____ If yes, what are they?

____

____

____

____

PERISTOMAL LEAKAGE FORM

1. How long did it take you to complete the Biographical Information Form?

____ minutes.

2. Was this questionnaire difficult to understand? YES ____ NO ____

If yes, please describe what was difficult for you to understand.

____

____

3. Do you think there are any other questions I need to ask?

YES ____ NO ____ If yes, what are they?

____

____

____

____

RECOVERY SATISFACTION QUESTIONNAIRE

1. How long did it take you to complete the Biographical Information Form?

____ minutes.

2. Was this questionnaire difficult to understand? YES ____ NO ____

If yes, please describe what was difficult for you to understand.

____

____

3. Do you think there are any other questions I need to ask?

YES ____ NO ____ If yes, what are they?

____

____

____